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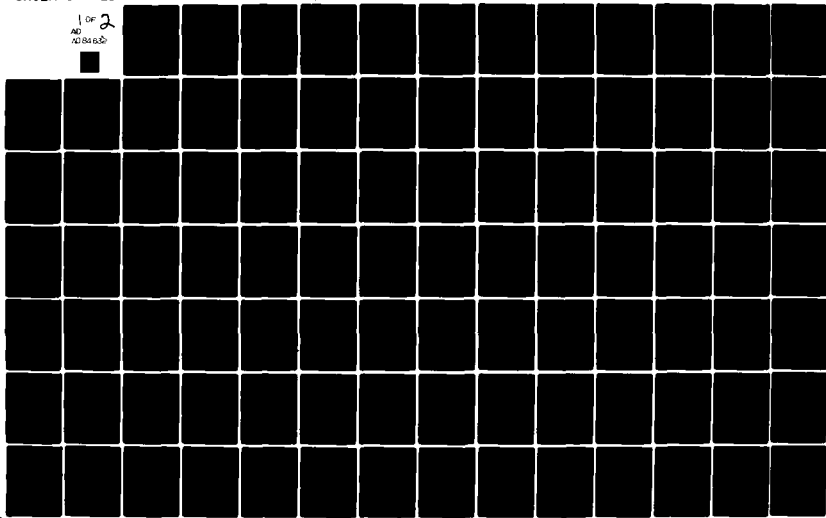
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Submitted by

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STUDY PURPOSE

President Carter, in his statement of May 19, 1977, committed the United States to a policy of restraint in transfers of conventional arms. At the same time, the President stated that the United States would continue to utilize arms transfers to promote its own security and the security of its close friends. The assessment of the legitimate security needs of such friendly states depends in the first instance on estimates of the threat. However, the demand for weapons, including high-technology systems, is a function not only of threat estimates but also of the recipient's chosen method of warfare. There is therefore a need to identify those methods of warfare which can satisfy the legitimate security needs of friendly countries while reducing the requirement for arms, particularly costly, high-technology weapons which may lead to regional instability, jeopardize economic development, and reduce prospects for arms control.

This study describes, explains and contrasts the relational-maneuver and the firepower-attrition forms of warfare in the context of case studies of Iranian and Korean defense.

EXECUTIVE SUMMARY

1. It is not widely recognized that the demand for ambitious high-technology weapons of complex structure is a function of the specific nature of the chosen operational methods of warfare and not merely of the quantum of military capability desired, of prestige incentives, and so on.
2. In all warfare, two phenomena contend: attrition and relational-maneuver; all armed forces rely on elements of both, but in sharply different proportions. In the former, the enemy is treated as a mere array of targets, and victory is to be achieved by a process of cumulative destruction by firepower; in the latter, the target is the enemy's fighting system as such, and the aim is to dislocate, disorganize and disrupt the whole rather than to destroy its single elements in a progressive fashion. Accordingly, attrition methods seek to optimize weapon use to maximize destructive efficiencies; such methods are therefore technology-driven, and of universal applicability. In relational-maneuver by contrast, the aim is to optimize terrain advantages, cultural factors and ad hoc force configurations to exploit identified enemy weaknesses; such methods are "relational" in the sense that they are responsive to the local context and the specific nature of the enemy. Weapon efficiency as such may be deliberately sacrificed to achieve disruptive effects.
3. Since attrition methods achieve their effect by the straight application of firepower, they generate a demand for large-payload attack aircraft, much artillery and all the elaborate supporting, supply and C³ structures that both need (low teeth-to-tail ratios). Moreover, since many lucrative high-contrast targets are thereby presented, (e.g. on the ground: positional deployments defensively; large slow-moving concentrations offensively), thick air defenses become necessary also. Since relational-maneuver methods achieve their effect by deception and fluid action to achieve first surprise, then shock and finally

disruption, they generate a demand for agile forces of simple structure (high teeth-to-tail ratios.) While the elaborate "integrative" systems of firepower methods are discounted, weapons and vehicles may or may not be simple, except insofar as the nature of the culture defines the limits of acceptable complexity in any relational approach; hence weapons will tend to be simple in the case of developing countries. Since fewer stable, lucrative and high-contrast targets are thereby presented, air-defense requirements are correspondingly limited.

4. In the current practice of the U.S. armed forces, a rather extreme attrition orientation is so deeply embedded that it may scarcely be recognized that the alternative of relational-maneuver methods exists; U.S. military men mostly assume that forces of simpler structure with less elaborate weapons must simply be inferior. These practices and the resulting attitudes have now been widely disseminated by U.S. security assistance programs. As an inadvertent result, imitative demands have been generated for high-technology weapons even where the underlying assumptions of cultural/economic compatibility and of material superiority - for attrition methods do of course implicitly assume a material superiority overall - cannot possibly be valid. In such cases, awareness (and institutional acceptance) of relational-maneuver methods could discourage the acquisition of weapons that do not fit the cultural/economic milieu, and would instead have prompted a search for force configurations and terrain schemes capable of overcoming material inferiority. That of course is the motivating dynamic of relational-maneuver methods, which avoid the attritive clash of strength with strength precisely because it is only by exploiting specialized or localized superiorities that an enemy materially superior overall may be overcome. Such is the genesis of German relational-maneuver methods in recent history, of Israeli methods now, and of guerilla methods in general.
5. Two case-studies have been presented below to illustrate the contrast. In the first, the force-structures, theater-strategy, operational methods and tactics of the ROK armed forces are examined in detail, and a

relational-maneuver alternative is then described. In it, the present artillery-dependent, dug-in, ground defense by generalized formations is to be replaced by specialized strong-point formations and complemented by the deployment of agile light infantry forces; a positional defense strong in anti-tank obstacles and weapons would still be needed astride the direct invasion axes leading to Seoul, but even in that case simpler, cheaper and more versatile alternatives to conventional field artillery (mortars and rocket-launchers viz. howitzers) and to expensive specialized anti-armor weapons are offered (gun-armed tank-destroyers and armored cars viz. tanks, TOW companies and ATGM helicopters). As far as the ROK Air Force is concerned, it is argued that the tendency to rely on airpower to make up for the shortcomings of a fragile ground defense should be resisted, and that no specialized interdiction and Close-Air-Support aircraft (A-10s/A-7s) should be procured. Instead of the present destroyer-based navy, in any case obsolescent, a small-craft/coastal submarine navy is advocated.

6. In the second case-study, the Shah's military system is examined and then compared to a relational-maneuver alternative. Instead of large armored forces, primary reliance would be placed on a fluid light-infantry/sapper defense of the northern mountain barrier, with only small tank forces being still needed, to seal the exits from the mountains. Aside from helicopters and ground air-defense weapons, as well as a thin air defense, much of the Shah's very elaborate army and air force force-structure would then no longer be needed. As for the navy, a relational approach would exploit the Western need to secure access to Gulf oil in order to offload that responsibility for the security of the SLOCs. Iran would then proceed to deploy a missile-boat navy (which could still suffice to achieve superiority over all the local navies inside the Gulf). If ASW capabilities were still needed for the Arabian Sea, land-based ASW fixed-wing and helicopter systems are advocated, these being much cheaper and less vulnerable to obsolescence than ASW warships.
7. In both cases, the relational-maneuver approach results in forces that are much resilient defensively and also much less provocative even though

their tactical/offensive content would actually increase. In both cases, demands on the civil economy are reduced (hard-currency being salient for the ROK; technical manpower for Iran). More important from a U.S. strategic point of view is the fact that relational-maneuver methods would result in theater defenses altogether more robust, thus reducing the likelihood that U.S. combat forces would be needed in the event of conflict: or, if still needed, making it less likely that U.S. forces would have to be deployed in the chaotic context of a disintegrating* defense. This more than compensates for the fact that relational/maneuver forces would be less easily interoperable with U.S. forces, since they would have different equipment in part, and very different methods, tactics and procedures.

8. In conclusion, an attempt is made to generalize the lessons of the two case studies: first, precisely because of the extreme attrition orientation of U.S.-style force-structures, there is much room for re-orientation towards relational-maneuver methods. Second, this will normally entail the possibility of achieving considerable economies and, on balance, should diminish "provocative" weapon deployments. Third, the resulting forces, being more congruent with local conditions, should be no less resilient and notably less vulnerable to outright debacles, this being an important strategic advantage from the U.S. point of view insofar as the U.S. has responsibility for theater security. Fourth, (a negative consequence), the U.S. balance of payments will suffer, since U.S.-style weapons will be less in demand. Fifth - another negative consequence in many ways - the locus of decision-making will shift since USG is not equipped to develop adaptative schemes of defense in a relational manner. A final consequence is that the internal security capabilities of relational forces will tend

* As demonstrated in detail in this report, the present ROK defense is brittle; good troops and fair weapons are organized into positional defenses whose rigid character is meant to force the enemy to concentrate in conveniently targetable massed formations which artillery fires are then to reduce by sheer attrition. But such an artillery dependent structure is fragile: first, because of the range superiority (and hard emplacements) of North Korean artillery; and second because the rigid positional deployment is highly vulnerable to light-infantry infiltrations leading to envelopments and disruptive ambush/attack combinations. In the case of Iran, the attempt to field sophisticated armor-mobile forces and a hyper-sophisticated air force with manpower of low-quality would have assured a debacle against serious opponents actually able to maneuver their armor, and use electronic warfare effectively.

to be higher; certainly the high-technology weapons and elaborate supporting structures of attrition-oriented forces are most ill-suited for population-control tasks.

I.A.(i) INTRODUCTION: THE KOREAN ARMED
FORCES, NORTH AND SOUTH

1. The armed forces of the Republic of Korea are large, apparently well-trained and highly motivated. The ground forces are organized on the model of the U.S. Army of the early 1950s and retain a "triangular" regimental structure. Almost all ROK equipment is of U.S. origin or design, and officer training as well as tactical doctrines are all derivative of the American model.
2. As a result, the ROK forces, like those of the U.S., are largely oriented towards attrition warfare, in which primary reliance is placed on achieving a superiority in firepower, to destroy the enemy in a process of cumulative reduction.
3. North Korean forces appear by contrast to be maneuver-oriented on the Soviet model (for the armor) and the Chinese model (for light infantry). Instead of attrition, primary reliance is placed on maneuver and disruption, to be achieved by the infiltration of light forces, and the subsequent penetration and envelopment by main forces. Instead of the cumulative process of attrition, operations are aimed at securing victory by inducing organizational paralysis in the enemy force. Such operational schemes seek to confuse the enemy command, demoralize his troops and disrupt the reaction and coordination of his formations (and between forces in forward positions and their dedicated fire support). Although the North Korean force-structure actually includes more artillery than that of the ROKA, its primary role is to support maneuver tactics by suppression and shock, rather than to reduce the ROK's strength by sheer attrition.
4. The basic doctrinal difference in the operational methods of the two armies is fully manifest in their force-structures. While the ROK army is not much smaller (540,000 viz. c. 600,000 troops),* the

* Military Balance 1979-1980, p. 68 -69. Until recently, ROK forces were generally considered inferior even though numerically stronger than those of the North.

North Korean has twice as many maneuver battalions; although the latter are considerably smaller than comparable ROK battalions, their unit firepower is roughly equal. Thus, paradoxically, the distinctly poorer society of the North has the more capital-intensive army. For example, the North Koreans deploy more than twice as many tanks (and anti-tank weapons) as the ROK army; and, while in light artillery the two sides have comparable numbers, the North has twice as much larger-caliber artillery and three times as many heavy mortars. The North also has some 1,300 multiple rocket launchers, these being shock and suppression weapons par excellence.*

5. At the tactical level, ROK infantry units are primarily trained to fight in a semi-static positional manner, their chief function being to "organize" the battlefield for the application of artillery firepower, by inducing the enemy to concentrate in front of each position. By contrast, neither their structure nor their training endows these infantry divisions with the capability to wage a war of small-unit counter-maneuver. The North Koreans by contrast, have large numbers of light-infantry troops trained specifically for small-unit fluid infiltration tactics.
6. The ROK Navy is similarly a conventional gun-armed surface force in large part, whose major element consists of (nine) gun-destroyers, (seven) gun-frigates and (six) corvettes, also gun-armed. The missile-boat element is small and there is no submarine force. The North Korean Navy is by contrast a classic sea-denial "maneuver" force, with 300+ small craft and missile boats, and fifteen submarines.
7. In a natural fulfillment of the U.S. model, the ROK also deploys one Marine division and two Marine brigades, along with some landing craft.
8. Largely because of funding restrictions, the ROKAF exhibits much less deformation-by-imitation; its bulk consists of four (large) squadrons (149 F-5Es) of light-weight fighters suitable for daylight air-combat

* Military Balance, op.cit., p. 68.

and (secondarily) close air support; and 55 F-4D/Es,* primarily suited for interdiction as well as interception. The North Korean Air Force has many more combat aircraft (565 viz. 250+) but more than half of the force consists of types obsolete in the Soviet Air Force (MiG-15s, IL-28s). Aside from that it is a "balanced" force, imitative of the 1950s Soviet model, with a more modern adjunct of some 120 MiG-21s.

9. The central element of the present U.S.-sponsored theatre-strategy consists of the I Corps Group, a force of eleven ROK divisions and the U.S. 2nd division. This force protects the Seoul area from invasion by the most direct routes. At the operational level, the focus is on holding barriers and positions in the I Corps Group sector, in order to induce the North Koreans to concentrate into conveniently targetable mass formations, which are then to be decimated by artillery and air attack (largely U.S. air attacks). On the North Korean strategy, rival conceptions now contend, as noted below.

* Including those on order, The Military Balance 1979 - 1980, op.cit., p. 69.

I.A.(ii) OFFICIAL PERCEPTIONS OF THE THREAT, IN OUTLINE

A number of distinct operational forms of the threat are salient in current U.S.-ROK planning; some would be complementary in an offensive, others are mutually exclusive.

1. The Deliberate (Prepared) Offensive. It is envisaged that twelve or more North Korean divisions would attack down one of the major invasion corridors leading to Seoul (Ch'orwon or Kaesong) in the first phase of such an offensive. Each of the corridors is now defended by a single Corps of three or four divisions. North Korean regular infantry formations supported by armor and heavy artillery fire would seek to overwhelm the Corps in their path to open the way for a follow-up armored breakthrough to Seoul.
2. "Blitzkrieg". This presumes surprise. In the absence of adequate warning, the assigned ROK regular forces could not fully man the barrier defenses in the Seoul corridors, and the militia could not carry out its planned task of laying minefields. Accordingly, given surprise successfully achieved, it is envisaged that the North Koreans would attempt a classic, high-speed, deep-penetration offensive by massed formations of battle tanks, to break through the anti-tank barriers before they could be closed and adequately defended. Since the North Koreans could deploy their forces in jump-off positions without being detected, and since front-line ROK forces are now concentrated in a forward perimeter defense, this threat is particularly salient. To be sure, the barrier systems on the Seoul corridors are laid out in depth from the DMZ to the city outskirts. But the defense of these barriers depends in part on troops that must withdraw to hold them in sequence. It is feared that the high-speed elements of the armor "Blitzkrieg" (and/or airborne assault troops) could seize the barriers before they can be fully manned by either withdrawn troops, or by allocated reinforcements.

3. Long-Range Artillery (In Hardened Positions). The large and diversified North Korean artillery forces would provide normal fire support in the context of the above threats. But, the North Koreans are also especially well-equipped to neutralize the ROK artillery on which, as we shall see, the defense greatly depends under the current attrition strategy. Much of the heavier North Korean artillery is deployed in hard emplacements (the so-called "Y" emplacements) which no current U.S. munitions can reliably destroy. There is as a result a serious counter-battery threat since almost all ROK artillery must operate within the range envelope of North Korean guns in order to support front-line forces. (Soviet-built 130mm guns in North Korean service outrange all U.S.-built howitzers in ROK service, except for the small number of M-107 175mm guns.)

4. Harassment of the Seoul Capital Area. The North Korean inventory includes FROG unguided rockets with a range sufficient to reach the Seoul area. In addition, it is possible that some Soviet-built 180mm long-range gun-howitzers are also in service. It has been suggested that these weapons, (and possibly also the 130mm guns) might be used for the long-range bombardment of the Seoul area with RAP rounds. The harassment of the Seoul area by remote firepower might take place in conjunction with threats (1) or (2) above (in order to demoralize the defense); or, alternatively, it might be carried out in isolation in a counter-value role or for psychologic purposes, possibly as a bargaining chip in intra-war negotiations. In any case, high accuracy would not be a requirement for such long-range bombardments.

5. The In-Depth Infiltration and Guerilla Threat. In addition to these regular-force threats, it is believed that the North Koreans might also launch a campaign of sabotage and guerilla-type raids against both military and civilian targets in the deep interior of the ROK. In a variant perception, this threat is thought to be directed against Corps rear areas. Such raids and sabotage missions would be carried out by activated in-country sympathizers (rural guerillas and urban

terrorists) and also by troops of the North Korean 8th Special Corps, infiltrated by air or by sea.*

NOTE: The tactical forms and magnitude of these threats are discussed under II.A.(ii) below.

* The 8th Special Corps controls commando-style reconnaissance units and infiltration-oriented light infantry.

I.A.(iii) THE U.S. - SPONSORED THEATRE STRATEGY
FOR THE ROK

1. Throughout the 1960s, U.S. war-planning for the ROK* was based on a "phased-withdrawal" theatre strategy. The latter was predicated on the global-strategic assumption that in the event of a full-scale invasion in Korea (as in Europe) the U.S. forces in place would be reinforced from CONUS, promptly and on a large scale. The U.S. would thus in effect take over the defense and the local forces would then act in an essentially auxiliary capacity. The immediate task of the defense was accordingly to preserve the integrity of the forces in the field, absorbing the momentum of an invasion by trading space for time.
2. This phased-withdrawal strategy was congruent with the characteristic U.S.-style attrition methods: it was envisaged that enemy forces would concentrate in order to attack each successive defense line in turn, each time becoming victim to air attacks and massed artillery and coordinated ground (machine gun) fires, both on the approach and in the assault.
3. The grave defects of this strategy were recognized in the mid-1970s.
First, it was appreciated that a strategy based on the assumption of large-scale troop reinforcements from CONUS was politically very fragile in the post-Vietnam environment;
Second, it was recognized that the short distances between the DMZ and Seoul would quickly expose the ROK capital area to artillery bombardment, if the "phased withdrawals" were made sufficiently deep to achieve their purpose. (And the great political impact of this threat was recognized also.)
Third, it was realized that the orderly conduct of multiple withdrawal operations would place extreme demands on the organization and cohesion of ROK forces, with the inherent danger of uncontrollable chain-reaction morale effects.

* That is, American planning for the use of both U.S. and Korean forces.

4. In any case, a "phased withdrawal" strategy only has a high pay-off if much territory is surrendered in each phase, so that (i) the enemy must carry out a lengthy logistic build-up in the wake of each withdrawal, (ii) the enemy's maneuver echelons over-extend themselves, thus becoming vulnerable to air and especially ground counter-attacks, and (iii) the enemy is forced to redeploy forward the entire array of his artillery and air defenses at each stage. In Korea, the proximity of the non-expendable Seoul area to the DMZ means that the depth needed is simply unavailable.
5. Further, in the struggle of regimes for the control of the peninsula any ROK territorial losses, however minor, could be of great psychological and political import. Such losses could reduce confidence in the ROK Government at home and weaken its bargaining position in the event of intra-war negotiations, while at the same time allowing the North Koreans to reap the diplomatic benefit of a prompt cease-fire offer: the in-place lines of such a cease-fire.
6. The current theatre strategy* retains "phased withdrawal" as a fall-back option, but emphasizes a firm defense of the forward line. The operational goal is to provide adequate time for the attrition of enemy maneuver echelons by artillery fires and air-ground strikes. In order to implement the plan, ammunition allowances were doubled for the artillery, and a substantial increase in the number of tubes is also underway. In addition, there have been special requests from the theatre for Improved Conventional Munitions.
7. A critical tactical component of the new theatre strategy is the much-increased emphasis given to the use of fixed, semi-fixed and expedient anti-tank obstacles, as well as to the acquisition of anti-tank missiles. This is of course a response to the increased North Korean armor threat. Under the aegis of the forward defense strategy, there is by contrast no significant reliance on the use of armor for counter-maneuver operations on a front-wide scale. ROK tanks are now distributed to serve as infantry-

* Associated with the tenure of Generals Stilwell and Hollingsworth.

support weapons, at the rate of one company per division and, at Corps level, in two brigades and seven independent tank battalions. This manner of deployment obviously precludes decisive counter-ripostes and more generally the use of armor in a maneuver mode.

8. The new defense plans and dispositions have undoubtedly corrected the fatal defects that had overtaken the previous strategy. Nevertheless the current strategy appears to be dangerously over-specialized, being severely optimized to respond to a specific strategic and operational form of the threat. In practice, the current strategy rests on the central assumption that the North Koreans would aim from the start at maximal objectives. It makes no allowance for less direct North Korean strategies and military tactics.
9. Specifically, the current strategy focuses almost exclusively on the threat of an all-out invasion against the Seoul corridors; the possibility of offensives initially directed against other sectors is discounted. It is true of course the most direct path to Seoul is indeed by way of the "invasion corridors". But precisely to the extent that the current U.S.-ROK strategy is perceived as credible by the North Koreans, the direct offensive aimed at breaching the Seoul corridor defenses becomes the less probable threat. Just as the new U.S. strategy was a response to changed conditions (both in Korea itself and in the external politico-strategic environment), now from the North Korean viewpoint the new U.S.-ROK defense strategy itself represents a major change in conditions, which requires in turn a change in North Korean strategy. Such a new North Korean strategy might be to maintain the appearance of the threat against the Seoul invasion corridors, while actually preparing to attack elsewhere.
10. Second, the current strategy is critically dependent on the ability of massed artillery and coordinated ground fires and air strikes to destroy enemy forces by sheer attrition. Even if the main enemy effort were in fact to develop in the Seoul sector, the underlying operational assumption that the enemy will attack in conveniently targetable massed formations may not be valid.

To the extent that the firepower of the defense is perceived as formidable by them, the North Koreans have a corresponding incentive to minimize their vulnerability by adopting firepower-avoidance tactics such as night attacks (against positions) and fluid infiltration (to by-pass frontal positions). The rough Korean terrain does of course offer much opportunity for infiltration tactics.

11. The North Koreans now have considerable latitude to use both controlled dispersion (= firepower-avoidance) tactics and also deep-penetration armored thrusts because the defense lacks operational balance. While its fixed elements may be strong, the defense is short of agile elements, that can use forward positions and barriers as pivot points for an active defense based on counter-infiltration and counter-thrust tactics.
12. Official perceptions of the threat reflect the assumption that North Korean troop training and low-echelon command methods would result in rigid and mechanistic tactics. Even if this were true, the North Koreans could still operate in dispersed formations; to avoid the firepower of the defense, or alternatively, to gain a quick decision, they could launch a deep-penetration armor "Blitzkrieg".
13. Both the first option, with its combination of rigidity and dispersion, and the second, with its combination of rigidity and exposed flanks, should make the North Koreans very vulnerable to counter-maneuver tactics. But the artillery firepower and close air support emphasized in the current theater strategy cannot in themselves exploit these potential North Korean vulnerabilities. Only an active defense could, by flanking and concentric counter-attacks to disrupt major enemy thrusts (and to annihilate trapped units), and by the interception of smaller penetrations.
14. Present tactics are essentially passive* during the entire first phase of a war, with ROK troops being entirely committed to defend forward

* i.e. tactically as well as strategically defensive.

positions and barrier systems. Only when attrition would sufficiently reduce North Korean strength would the U.S.-ROK forces go over to the offensive, this too being no doubt conducted in an attrition style, with a slow, broad-front, advance driven by air and ground firepower. Thus the initiative is conceded to the North Koreans in the first phase of a war. This leaves them free to plan both dispersed-infiltration and deep-penetration operations, confident in the knowledge that the defense is relying on static units whose duty is to produce attrition, and has no agile element available to take advantage of the imbalances and opportunities in the North Korean deployment.

I.A.(iv) TACTICAL ASPECTS OF THE THREAT, AND OF
THE ATTRITION-ORIENTED RESPONSE

(a) The Armor Threat and the Anti-Armor Response

1. The North Korean tank inventory has more than doubled over the last several years. Coincidentally, during this same period, the U.S. Army began to operationalize the threat to NATO presented by the large Warsaw Pact tank inventory in terms of a Blitzkrieg-style deep-penetration offensive. It appears that this perception has been transported from Europe* to Korea. Certainly it is now frequently suggested that there is a "Blitzkrieg" threat against the Seoul corridors.
2. The high priority given to this perceived threat is evident in the much-enhanced anti-tank barriers built on the invasion corridors to Seoul and in the procurement of narrowly specialized anti-tank weapons, notably ATGMs. (The ROK's own tank forces are also trained and deployed to operate primarily in an anti-tank blocking mode.) Partly no doubt, because of political reasons but also in reflection of 1950s U.S. military thought, the ROK's armor has not been configured to operate in a tactically-offensive (i.e., counter-maneuver) role, where its task would be to oppose North Korean armor by flanking attacks, temporarily advancing beyond the DMZ if necessary. Only during the later "eject and pursue" phases of a successful defense would ROK armor operate offensively, and even then only in support of the infantry (and thus at an infantry pace).
3. The construction of major anti-tank barriers on the Seoul invasion corridors is obviously a prudent investment. More questionable is the assumption that the North Koreans would rely on massed armor to spearhead an invasion, and the resulting emphasis given to this particular threat in formulating ROK equipment choices.

* The agents of this transmission are of course the staff officers who rotate into Korea for one year or less, and whose outlook is dominated by threat images imported from Europe.

4. One indicator is that the North Korean tank inventory is not concentrated in "mailed fist" formations on the Soviet model, (which consist exclusively of armored vehicles). Nor is the Korean terrain suitable for effective armor tactics, whose essence is always and everywhere to use cross-country mobility to avoid the enemy's main strength rather than to attack it head-on. In Korean conditions, massed formations of armor would be canalized by the terrain into predictable avenues of advance. In the presence of a defense amply equipped with anti-tank weapons, effective armor operations must by contrast exploit mobility in order to attack from unexpected directions. The North Korean tank inventory (2,150 MBTs and 350 T-34s) are divided into three roughly equal parts: two tank divisions, five armored regiments attached to corps echelons, and 42 companies and battalions organic to infantry and motorized divisions. Thus only the first third amounts to massed armor in Soviet-style combined-arms formations. This strongly suggests that for North Korean armor the "Blitzkrieg" capability may be no more than a secondary adjunct to infantry-support operations.
5. In contradiction to the above, it could be argued that administrative arrangements need not prescribe the manner of tactical employment, and that just prior to the outbreak of hostilities the separate regiments and divisional battalions might swiftly be formed into suitable all-armor maneuver formations. These concentrated units could then launch a "Blitzkrieg" offensive by massed armor, with the improvised formations fighting alongside the two "tank" and three motorized divisions of the peacetime force-structure.
6. Such a wartime re-arrangement could, it is true, be envisaged in North Korean plans. Certainly two tank divisions, with a total of less than 600 battle tanks, would amount to a force much too small to execute a deep-penetration offensive to Seoul, given the depth of the fixed defenses and the size of the ROK forces that would be encountered. An attack of this kind could only be effective against a defense lacking in anti-tank weapons (as in 1950) or, alternatively, if the armor assault were planned for the last phase of an offensive, and not the first, that is to say for the coup de grace. If that were so, the priority assigned to the armor threat is now greatly exaggerated.

7. In fact the North Koreans are most unlikely to rely on improvised armor formations to provide the cutting edge of an offensive. Certainly any Russian advisors would categorically reject such a plan. Wartime experience, the peacetime exercises frequently conducted by full-scale Soviet formations, as well as lessons learned from studies of the Arab-Israeli wars of 1967 and 1973 have all produced much armored warfare expertise in the Soviet Army. A fundamental lesson is that prolonged combined-arms and command training by the full formations of massed armor is absolutely essential before deep-penetration operations can be attempted in the reality of combat.
8. By contrast, no such training requirement applies if the tank battalions of the infantry divisions (and the corps-level armored regiments) are to be used only to support infantry formations.
9. The definition of the operational form of the North Korean use of armor is of direct relevance to ROK force-planning and equipment choices. If the priority accorded to the massed armor threat reflects only the limited potential indicated by the North Korean force-structure, (i.e. two tank divisions) rather than the conceptualized Blitzkrieg threat, (whose much larger dimensions are set by the total number of battle tanks in the North Korean inventory), then ROK acquisitions of expensive and narrowly specialized anti-tank weaponry should be correspondingly reduced.
10. While it is clearly essential to maintain the current barrier defenses, (and indeed they should be manned continuously, as a hedge against a surprise attack), the procurement of expensive and narrowly specialized anti-tank weapons such as TOW should be restricted. More versatile systems, effective against infantry as well as armor should be bought instead to complement anti-tank missiles, and the ROK tanks themselves.
11. In this context, it is downright paradoxical that the ROK is now being encouraged to deploy special-purpose TOW companies to be distributed on the basis of one per division. While such TOW companies would be well-suited to counter small armor detachments (operating in an infantry-support role) they are not likely to perform well against massed armor breaking through in the true Blitzkrieg-style, with heavy artillery

covering fires. The slow rate of engagement, poor close-in performance, lack of battlefield mobility and vulnerability to artillery suppression inherent to TOW-type weapons would not seriously detract from their utility in countering small tank detachments executing slow-paced attacks. But against the envisaged high-speed assaults by massed tanks, pure TOW units are likely to be much less effective than mixed gun-and-missile anti-tank detachments.

12. Although so much prominence is now given to the armor threat, the ROK ground forces are still far from being well equipped with modern armor-defeating weapons. No doubt because of the ROK's wholesale adoption of U.S. infantry organization as a model, the simpler and cheaper armor-defeating weapons widely used in Europe (but not favored by the U.S. Army) are absent from the ROK's inventory also. Thus the ROK has no gun-armed tank-destroyers, no low-pressure anti-tank guns, nor for that matter, conventional, full-recoil, anti-tank guns. Instead, at the low end of the spectrum, rocket launchers and recoilless weapons are still being procured, in spite of their advanced obsolescence.*

13. Anti-tank equipment options for the ROK (including minelet systems) are discussed under I.D.(iii) below.

* Similarly, the procurement of anti-tank missiles had to await their belated production by the U.S., in spite of the fact that British, French, and German anti-tank missiles have been available for many years. While distinctly inferior to current U.S. (or European) missiles such as TOW (or HOT) the first-generation missiles (SS-11, Vigilant, Kobra) of the 1960s were still altogether superior to recoilless rifles.

(b) The Hardened Artillery Threat and the Counter-Battery Problem

1. An obvious problem of the current defense structure is its great reliance on artillery firepower, against an enemy whose own artillery forces have inherently superior counter-battery capabilities. It is not the numerical superiority of North Korean artillery that is of decisive importance but rather its combination of hardened emplacements and superior range. Even if both the threat perceptions and the wisdom of the attrition-oriented defense plans were accepted at face value, it is clear that the shortcomings of the present array of ROK artillery must be corrected if these plans are to be implemented effectively. The currently planned increase in the number of ROK artillery weapons will be very expensive, and yet it will not solve the problem. The ROK's artillery must instead be re-oriented towards different weapon types.
2. The Soviet-built guns and gun-howitzers in North Korean service in the 122mm, 152mm and 130mm calibers are rather old. Nevertheless, they outrange the U.S.-built 105mm, 155mm and eight-inch howitzers of the ROK. (The ROK's only modern long-range guns are twelve 175mm self-propelled M-107s.)
3. Airpower cannot dispose of the counter-battery problem. The critical part of the North Korean artillery is deployed in highly protected firing positions, excavated in the hills facing the DMZ (the so-called "Y" emplacements). Air-to-ground missiles of the Maverick type could, in theory, be effective against these small and hard targets. However, the prior need to suppress air defenses, the sheer number of targets, and severe target designation problems in the face of smoke, camouflage and deception, would all prevent the rapid execution of an artillery-suppression campaign. And yet the defense must use its own artillery to full effect from the first, and indeed it would rely especially heavily on artillery fires at the beginning of a war.

4. To be sure, "shoot-and-scoot" tactics can be (and would be) used by the ROK artillery to contain actual losses to counter-battery fires; but this protective tactic inevitably degrades performance. It should be noted, moreover, that the U.S. artillery weapons in the ROKA are not particularly well suited for rapid-paced "shoot-and-scoot" tactics.
5. The counter-battery threat thus threatens to undermine the entire tactical system of the defense.
6. Moreover, it should be noted that the present ROK artillery inventory is not particularly efficient in terms of the current operational requirements (while being basically ill-suited to support a more versatile maneuver-oriented defense). The additional artillery procurements now envisaged would merely perpetuate the present shortcomings.
7. Longer-range U.S. artillery weapons are now finally being developed, in a belated response to the established range-superiority of Soviet guns. The ROK should perhaps defer some of its procurements until these weapons are available. In any case, more efficient 155mm howitzers should be obtained instead of the 105mm howitzers now being procured.* Multiple rocket-launchers should also be acquired for surge fire, in lieu of procuring much more expensive tube artillery for concentrated TOT (time-on-target) fires. Finally, much more emphasis should be given to the procurement of large-caliber mortars, (especially useful for high-angle fire against reverse-slope targets to counter fluid infiltration and "hugging" tactics). Mortars are of course very much cheaper than equivalent howitzers. The progressive replacement of the large number of 105mm howitzers now in service with rocket-launchers, efficient 120mm/160mm mortars and modern 155mm howitzers (and guns if available), could result in very considerable economies overall.

* 105mm howitzers already constitute 60 percent of the ROK inventory, as opposed to 25 percent in the U.S. Army (and less than that in most other modern armies).

(c) The In-Depth Infiltration and Guerilla Threat

1. The armed forces of North Korea include large numbers of light-infantry troops which are specially trained for infiltration and commando-style operations. In particular, the NK 8th Special Corps appears to be organized specifically to carry out such operations in the deep rear of the ROK, probably in conjunction with sabotage and raids by in-country guerilla and terrorist elements. However the 8th Special Corps accounts for no more than 35 percent of the total number of commando-style light troops deployed by the North Koreans. While the 8th Special Corps has four light brigades and five airborne battalions for a nominal total of 17,600 men (HQ elements included), each front-line division has an organic light-infantry battalion (rear divisions have a company), and each front-line Corps has two light-infantry brigades (rear Corps have one), for a nominal total of 30,000 troops.* These forces, also suitable for infiltration operations, are not assigned to the 8th Special Corps-whose troops are seemingly trained especially for sea or air infiltration.
2. Given their role in the overall force-structure, it seems that the light-infantry troops outside the 8th Special Corps would not be infiltrated into the ROK by air or by sea for sabotage and raids in the deep interior. Instead they would infiltrate the immediate front-line area, mostly on foot, to support conventional operations mounted by regular forces.
3. The U.S.-ROK response to the in-depth infiltration and guerilla threat as currently perceived, is evident in the deployment of active-army counter-infiltration battalions (part of the cadre-strength Rear Area Security Divisions) and in the wartime provision for Homeland-Defense Reserve Forces. In wartime, these forces would be distributed along the coastal areas of the ROK, and in its deep interior. But there appears to be no specific response to the battlefield infiltration threat; the latter might be of decisive importance, unlike the recognized threat. (See below, under I.B.(i).)

* Extrapolated from IISS Military Balance 1979 - 1980, and John Keegan, World Armies.

4. The ROK Navy has counter-infiltration and ASW as its primary missions. The force structure and its operational modes on the other hand reflect the model of the (blue-water) U.S. Navy. A much more appropriate would be that of the Norwegian and Swedish Navies, which have been relationally specialized for anti-invasion defense (and limited ASW) in the context of an island/archipelago environment - a geographical feature shared by South Korea in its western and southern coasts. This would result in a shift from destroyers and fleet submarines to many smaller, less visible (and cheaper) small craft.

I.B. THE RELATIONAL-MANEUVER ALTERNATIVE: KOREA

Overview

1. The alternative strategy here advocated is relational to the operational form of the threat, as well as to the terrain of the DMZ area and the general circumstances of a rapidly developing society which is, however, still poor.
2. It is argued that the salient North Korean threat could take the tactical form of fluid maneuver penetrations by infantry infiltration in sectors to the east of Seoul (viz. the massed assaults and tank offensives on Seoul of the threat as officially perceived). A relational defensive capability for the ROK should, therefore, include light (non-positional) infantry able to intercept the threat by its own fluid maneuvers in addition to the current positional defense.
3. The Seoul area would still obviously need strong defenses against the armored-thrust ("Blitzkreig") threat, as well as the mass invasion threat. It is argued, however, that the present structure of the defense neglects the rest of the DMZ front and notably the FROKA sector, east of the I Corps Group in front of Seoul.
4. On a more detailed level, it is argued that the ground forces should stop accumulating expensive howitzer artillery and should instead acquire (much cheaper) large-caliber mortars, as well as multiple rocket launchers for "surge" requirements - requirements which are now met by gathering large numbers of costly artillery tubes.
5. As far as anti-tank weapons are concerned, it is argued that the ROK should look beyond the classic MBT and the neo-classic ATGM to acquire a more versatile and cheaper mix of weapons. Specifically low-pressure AT guns in 4 x 4 armored cars should complement ATGMs, and tank-destroyers should complement (and substitute) MBTs.
6. More generally, it seems that there is a danger that the armor threat is being over-emphasized as compared to the light-infantry threat with the result that over-specialized weapons and systems are being acquired.

7. It is argued that the ROKAF should not develop into a high-cost force; it should retain the present priorities (i) an adequate air defense (mainly by light-weight non-AW fighters), (ii) a modest CAS capability as an adjunct; and (iii) very little interdiction - the latter not being meant for supply interdiction but rather to serve as a deterrent to terror air bombing or rocket attacks against the Seoul area.
8. The acquisition of AHs and/or specialized aircraft for the anti-tank mission such as the A-10 is evaluated as a dubious investment, since the armor threat is only a fraction of the whole, and it is already being met by strong AT forces (and obstacles) on the ground. Greater attention should instead be focused on really light attack aircraft (e.g. A-37s) and transport helicopters, to cope with infiltrating light infantry.
9. As far as the Navy is concerned, it is argued that the obsolete gun-armed warships of the present force are ill-suited to Korean needs, either to defend the Korean coasts, or to cooperate with the USN in defending the SLOCs.
10. Accordingly, a gradual evolution towards a gun/missile small-boat navy, with mine and counter-mine, but only limited ASW capabilities is advocated. Insofar as a ROK anti-submarine capability is needed, it should be provided by a combination of fixed-wing ASW aircraft and helicopters (for search and location) along with a modest number of small sub-chasers, rather than by large ASW warships (which are very expensive, and whose ASW sub-systems are soon outmoded).

I.B.(i) AN ALTERNATIVE DEFINITION OF THE THREAT, AND THE
REQUISITE THEATRE STRATEGY

(a) Introduction

1. It is argued below that the various capabilities present in the North Korean force-structure can be operationalized in terms of a strategy, and of tactics, which differ considerably from those envisaged in current U.S.-ROK defense plans.
2. It is not necessary to prove that this conception of the threat represents the reality of Actual North Korean war plans (see Paragraph 4 below). It should be noted, however, that the strategy and tactics presented below are consistent with local military traditions - unlike those of the established threat perceptions, which largely reflect the Soviet model. The strategy and tactics presented below are responsive to the political context in which North Korea must operate (as opposed to the established threat perceptions which characteristically ignore the political context) and more congruent with the specific capabilities found in the North Korean force-structure (unlike the established threat perceptions, which discount the very large proportion of light-infantry in the whole).
3. It should also be recognized that precisely to the extent that the current strategy of the defense is perceived as successful, the North Koreans have a corresponding incentive to circumvent it, by adopting an indirect strategy and firepower-avoidance operational methods, as described below.
4. But independently of the above, the alternative threat here defined constitutes a suitable and necessary test of the solidity and versatility of the defense. Its historical basis is succinctly described by V.J. Esposito:

In retrospect, the defeat of the U.N. forces in northern Korea contains several interesting lessons. The U.N. forces--initially, at least--were not greatly outnumbered; they possessed several times the fire power of their opponents and had outstanding superiority in armor and artillery. They were (with the relative exception of ROK units) fully motorized and suffered no major logistical shortages. Finally, they had complete air and naval superiority. Yet they suffered one of the most definite defeats ever inflicted on American forces by a foreign army.

The CCF were largely veterans of years of semi-guerrilla fighting, accustomed to hardship and hunger. After their initial clashes with the Eighth Army in October, they had concluded that--though American fire power was to be feared for its volume, range, and coordination--American troops were highly vulnerable to attacks from the rear and could be demoralized by cutting their communications. Further, they claimed that the Americans had no appetite for night or close-range fighting, and that American infantry were overly dependent on tank, artillery, and air support.

Consequently, the CCF operated basically as light infantry, maneuvering by preference through difficult terrain to establish road blocks in rear of U.N. forces before attacking them from the front or flank. Stories of CCF "human sea" attacks were largely the products of rear-echelon imaginations. Normally, the CCF attacked on a platoon or company front, reinforcing any prospect of success with great determination in an effort to split up the U.N. force under attack and then destroy it in detail. Experts at camouflage, scouting, and cross-country movement, they made habitual use of surprise and night attacks. Such tactics had great psychological effect. The road-bound U.N. forces, a modern army in a primitive mountain wilderness, sometimes found themselves as handicapped as Braddock at the Monongahela.*

5. The imputed North Korean tactics here presented are similar to the tactics which the Chinese developed in the 1930s (to overcome the matériel superiority of the Japanese) and to the tactics which the Japanese themselves later used in Malaya and elsewhere, to obtain high combat payoffs from logistically stretched forces. In essence, these tactics embody a fluid-maneuver approach to infantry warfare, and are specifically designed to circumvent the power of enemy artillery and the strength of prepared positions. Against defenses whose flanks are weak or actually hanging, this maneuver approach (usually in the form of circle and block tactics) has historically proved very effective, as in the Japanese invasion of Malaya in 1941 - 1942, in the 1950 North Korean (and later Chinese) offensives in Korea itself, and in the Sino-Indian Himalayan fighting of 1962.
6. The Korean terrain is particularly well-suited for fluid-maneuver tactics. The sharp hill and mountain countours with their scrubby vegetation, countless gullies and much broken terrain do not present

* The West Point Atlas of American Wars, Vol. II, Brig. Gen. Vincent J. Esposito, Section 3, Text to Map 10, 1967.

serious obstacles to the infiltration of light infantry forces if these are suitably trained. At the same time, the terrain has a sponge-like effect on the manpower of a linear defense. Because of the very short fields of fire (and observation) a strong linear defense in the American style would require more troops than the ROK could possibly deploy.

7. This applies particularly to the FROKA sector on the eastern side of the Peninsula. Owing to the high political cost of even small territorial losses, the ROK has been induced to place the bulk of its frontline forces virtually on the DMZ line itself, so that the nominal COPL (Combat Outpost Line) is in fact virtually identical to the forward edge of the battle area (FEBA).
8. The ROK forces try to reproduce the structure of the standard U.S. Army linear FEBA defense, with its two up and one back formula, but the wide frontages have forced most FROKA divisions to depart from this.*
9. The rather small number of maneuver units obtained from the force-structure (a common malady of forces patterned on the U.S. Army model), the absorptive terrain, the political imperative of a forward defense, and the linear troop dispositions have all resulted in what amounts to a thin cordon defense. This is inherently vulnerable to fluid maneuver penetrations (with preliminary infiltration) since flanks and rear are not solidly held in strong-pointed all-round perimeters, reserves are few, and most of the force is tied down to blocking positions astride vehicular approaches, or in terrain-dominating hilltop positions.
10. If North Korean infiltration and fluid maneuver tactics were to be employed against the FROKA sector on the eastern half of the peninsula, it is hard to see how the thin line of ROK forces could cope. Large parts of the FROKA frontal defenses may then collapse, thus opening axes of deep envelopment against the barrier defenses of the I Corps Group deployed on the western side of the DMZ to defend the Seoul invasion corridors. If the I Corps Group were then to come under frontal attack also, its forces would be

* In the case of one division for example, all three regiments are on the line; one battalion is back in each set of three, but the battalions on the line have all their companies forward. In one case a single battalion is holding 16 kms. of frontage. Similarly, ROK artillery is also deployed well forward, much of it being within 6 kms. of the DMZ.

over-extended, and could be overrun.* If on the other hand, the FROKA defenses do not collapse, multiple penetrations by light infantry units may still occur. These could force the ROK Government to divert significant forces from the I Corps Group front to recapture terrain in the FROKA sector, thus facilitating a subsequent North Korean offensive against the Seoul invasion corridors.

11. Further, it appears that the I Corps Group sector is not immune to fluid maneuver tactics either. While the troop density is much higher and flanks are much more solidly held than in the FROKA sector, light infantry could still infiltrate through the frontal positions. Lacking as it does an adequate component of agile troops, the defense would find it difficult to prevent penetrations and lateral envelopments, even if all frontal positions were to resist attack.

* In the very worst case, an infectious disintegration of the I Corps Group forces might be precipitated by chain-reaction morale effects originating in the FROKA sector (and intensified by 8th Special Corps operations).

(b) The Tactical Aspects

1. The alternative threat here presented is based on the assumption that the 30,000 North Korean light troops, which are not part of the 8th Special Corps could be employed for the preliminary infiltration of the battlefield. Their initial infiltration might be timed to precede the overt outbreak of hostilities i.e. when the regular forces would attack on the front itself. Thus for example, their infiltration could begin at dusk, for a dawn H-hour. Operating by platoons or at most companies the light troops would penetrate to depths of up to 10 kms. or so, by- passing ROK frontal defense positions. Their tasks would include:
 - To uncouple the indirect fire-support (on which the defense of ROK forward positions now so heavily depends) by cutting telephone wires, and by positioning themselves to launch close-quarter attacks against the supporting batteries at H-hour. This could be supplemented by the jamming of front-line radio communications after H-hour.
 - To take up concealed firing positions astride access routes to the front in order to ambush or block reinforcement or supply flows, and to ambush any retreating forces.
 - To take up concealed firing positions in the rear of ROK front-line positions, and on high ground dominating the vehicular barrier defenses in the valleys, in order to simulate encirclements once the overt frontal attack has begun.
2. Thus upon the outbreak of overt hostilities, ROK frontal positions would come under heavy artillery fire, and would seemingly be threatened by regular forces approaching to attack them. Only then, when the defense would call upon its artillery for indirect fire-support, the combined effects of jamming and wire-cutting as well as the direct assaults against howitzer and mortar batteries, would become manifest. Unexpectedly deprived of the heavy fire-support on which the defense relies, ROK troops manning forward positions will also be coming under

fire from unexpected directions by infiltrated fire-teams. Their fire is unlikely to be seriously destructive, but it could be very demoralizing.

3. The immediate goals of the North Koreans would be to break the morale of the front-line forces to provoke them into flight, or at least to precipitate imprudent withdrawals (which would then be ambushed). Even if neither were to happen, the minimum goal would be to induce ROK command echelons to send up reinforcements hurriedly and these would be subject to ambush also.
4. In the meantime, the regular North Korean infantry (and divisional armor battalions) would only launch determined attacks against those few positions which actually block desired axes of penetration. Normally such attacks would take place at night, with silent approaches and the use of "hugging" tactics to negate close air support and artillery. Elsewhere, North Korean regular forces, and especially the armor battalions, would merely maintain the appearance of a threat against FROKA vehicular approaches with feints and demonstrations, and would not launch determined (= costly) attacks.
5. Otherwise, the regular infantry would seek to wedge and then roll-up the defenses, initially by-passing heavily defended barriers by way of the higher ground. North Korean infantry columns would avoid the stronger defenses of the low-lying vehicular approaches, advancing instead through broken terrain and on paths not directly guarded.
6. The North Korean goal at this stage would be to use the regular infantry penetrations to reach and disrupt the divisional rear areas while some of the forces involved would peel off to outflank and encircle ROK forces still deployed to guard the vehicular approaches against frontal attacks. North Korean divisional and Corps armor elements assigned to the FROKA sector would not actually attack the vehicular-approach defenses

until the combination of infiltrating light infantry, and the regular-infantry penetrations had already undermined the integrity of the FROKA defenses as a whole. They would not launch frontal attacks against barrier defenses still effectively manned. Only if and when these collapse, would North Korean armor be sent in to accelerate and deepen the penetration of ROK frontal defenses in the FROKA sector.

7. Any North Korean tank columns which penetrate the western half of the FROKA sector could be used to intensify the flank-attack threat against the I Corps Group. Tanks and vehicles in general would however play only a secondary role in these tactics, since unlike the light infantry (or the regular infantry operating in a fluid-maneuver mode) vehicles would unavoidably be vulnerable to artillery and air attack, and their movement would be greatly restricted by the terrain.

(c) The Political Context

1. The most important quality of the alternative North Korean strategy here presented is its political flexibility. The offensive would be structured as a multi-phase operation, with each phase entailing a strictly limited commitment of resources, and a limited degree of strategic exposure, both being proportionate to the political gains that each phase might separately be expected to achieve.
2. Phase I of the North Korean offensive would be aimed at the FROKA sector using the tactics described above.

While the North Korean divisional and corps armor elements deployed against the FROKA sector would seek to tie down the ROK forces defending the vehicular - approach barriers (while these were actually being outflanked), the main, tank-heavy, forces deployed opposite I Corps Group and the Seoul invasion corridors would act only as a decoy threat in this phase with the actual first-phase offensive being aimed against the FROKA sector. In Phase I, the main North Korean forces would not be launched in determined frontal attacks against the I Corps Group defenses.

3. At the beginning therefore, the fighting would have the general character of a large-scale border incident, essentially confined to the FROKA sector. This might well be the viewpoint of observers far from the scene, including policy-makers in Washington, Moscow and Peking.
4. If the American reaction to this first phase of the offensive is unexpectedly strong, or if ROK defenses prove to be much more resilient than expected, or if the PRC and or Moscow were to apply decisive pressures upon them to cease and desist, the North Koreans might then abandon their wider offensive intentions. Instead they would try to secure some political and diplomatic gains by calling for a cease-fire in place. At this point, their main forces deployed opposite the I Corps Group would still be intact, and they might have made at least some minor territorial gains in the FROKA sector.

5. Even the most modest territorial conquests could gain significant political benefits for the North, by undermining South Korean confidence in the ROK regime, and by inducing a collapse in investor confidence. Diplomatically on the other hand, North Korean calls for a prompt cease-fire in place would place the onus of continuing the fighting upon the United States and the ROK. Domestic U.S. and world opinion might well react unfavorably to the USG's pursuit of a dangerous conflict for the sake of "minor" territorial recoveries which might well seem insignificant to non-Koreans.
6. But if both external political circumstances and also the military situation develop more favorably, the North Koreans would then launch the Phase II. of the offensive.
7. Even if the FROKA defenses hold, territorial gains made by the North Koreans even if minor might still induce the ROK to redeploy forces from the Seoul invasion corridors to carry out reconquest operations in the FROKA sector. The military risks of doing so would be obvious, but the very possibility of a limited North Korean offensive (i.e., first-phase only) would confront the ROK leadership with a very difficult choice between political necessity (i.e., the avoidance of territorial losses) and military prudence.
8. Moreover, even localized penetrations of the western half of the FROKA sector might still open the way for flanking infiltrations into the rear of the I Corps Group, with the aim of disrupting the barrier defenses.
9. In Phase II, I Corps Group positions would come under heavy North Korean artillery fire, while the defending U.S.-ROK artillery would be reduced by a major counter-battery effort. Next, North Korean infantry employing fluid maneuver tactics would be sent into action in the I Corps Group sector. These forces would use infiltration and lateral "roll-out" tactics to disrupt defensive lines, while strong ROK positions would be by-passed, and left to follow-up forces. The aim at this stage would be to disrupt the defensive lines and barrier systems laid out in depth between Seoul and the DMZ.

10. It is evident that the attrition-oriented defense-by-artillery envisaged in current U.S.-ROK plans, can only be effective against conveniently targetable mass formations, e.g. concentrated forces moving down the vehicular axes. By contrast, infantry moving at night in dispersed order, or else moving through broken terrain in fluid maneuver groupings could not possibly be defeated by sheer firepower attrition. The effectiveness of artillery fires expended on dispersed infantry is bound to be very low in the Korean terrain.
11. In Phase II, the I Corps Group barrier defenses would come under attack, simultaneously, from the front and from the flank. At the same time, North Korean 8th Special Corps forces might also try to attack the barriers by vertical envelopment. The effect of these North Korean attacks in the rear of the barrier defenses is likely to amplify the morale effects of any North Korean successes in the FROKA sector. In addition, the harrassment of the entire sector (all the way back to Seoul) by FROG rockets and long-range artillery (possibly using RAP rounds) would further intensify morale effects.
12. Even in the course of Phase II, the North Koreans might suspend operations at any time (except for the harrassment of Seoul by rockets and RAP gunfire) if the American, PRC or Russian reaction is too strong to be resisted. At this point the North Koreans could still revert to the cease-fire-in-place option, with the additional bargaining chips of any localized gains in the I Corps Group sector, as well as of their proven capability to bombard the Seoul capital area at long range. These military gains could be exploited politically and diplomatically in the context of intra-war negotiations. This possibility arises from the fact that the bulk of high-value North Korean forces (i.e., the tank and motorized divisions) would still be uncommitted during Phase II.
13. Finally, given favorable conditions, the North Koreans would try for the maximal political objective, by releasing the tank-heavy main forces against the I Corps Group defenses. By then the barrier systems should

have been weakened by multiple forms of attack. The "Blitzkrieg" threat would thus materialize after all, but only as the coup de grace. Without the preliminary disruption of the defense, the Blitzkrieg is not a feasible option for North Korea. At present, however, the over-concentration of the defense on the Blitzkrieg threat has the paradoxical affect of making that threat feasible after all, by limiting the ability of the defense to cope with the non-armor/non-frontal threat.

I.B.(ii) ESSENTIAL REQUIREMENTS OF A RELATIONAL DEFENSE

1. The alternative North Korean threat described above is of course hypothetical. But the separate capabilities from which the alternative strategy and tactics were construed are definitely present in the North Korean force-structure, and the threat is therefore real. Accordingly, it is essential that the defense be adapted to cope with this threat, which may materialize precisely because the threat as conventionally defined is being adequately countered.
2. At present, the defense is oriented against set-piece moves. At the tactical level, the main emphasis is on the application of firepower against conveniently targetable mass formations and against high-contrast armor targets. In view of the versatile nature of the North Korean threat, the defense too must be made more versatile (as opposed to merely being enlarged), in order to counter a wider variety of threats.
3. The augmentation of ROK capabilities now underway does not meet this requirement. The South has less combat capability in almost every category: infantry, armor, artillery, airpower, and in naval power also; and the aim of the Korean Modernization Program, ROK F.I.P. and of the new U.S. aid programs has been to correct deficiencies piecemeal. But the fundamental conceptual, doctrinal and structural questions have not been addressed. As a result, potential benefits have been undercut by (i) parallel but dissimilar force-improvements (and increases) in the North; (ii) by the failure to come to grips with the full range of specific tactical and strategic threats confronting the ROK, and (iii) by stereotyped and sometimes inappropriate responses to the threats which are recognized.
5. Specifically, it is argued above that the ROK ground forces as now structured and deployed could not effectively counter precisely those forms of the threat that are most consistent with the political context and with the military traditions, tactical orientation and specific capabilities of the North Korean armed forces.

6. It is obviously imprudent to rely on large-scale U.S. reinforcements to compensate for inadequacies in the design of the Korean defense. There is no need to stress the gravity of the political uncertainties. Both the salient threat envisaged in current defense plans, and also the multi-phase strategy described in I.B.(i) above could unfold very rapidly; therefore, if the North Korean offensive is not immediately checked by the forces in place, subsequent reinforcements would need to be very large indeed in order to reverse a situation by then precarious. On the other hand, a successful defense by the forces in place would quickly exhaust the offensive potential of the North Korean forces. If the initial defense holds, airlifted U.S. reinforcements would not be necessary. If the initial defense is collapsing, airlifted U.S. troops would have to be committed in a confused and highly dangerous situation, and could become involved in a front-wide debacle.
7. It would be even more imprudent to leave shortcomings in ground-force capabilities uncorrected, in the hope that they would be offset by air power. For the reasons presented below, air power is initially likely to be effective only for air defense, and not for close air support. Interdiction could be feasible from the start, but its impact is of course delayed.* A prudent U.S. military assistance policy for Korea and Korean planning should focus on improving the ground-force capabilities, rather than to allow deficiencies on the ground to drive the acquisition of costly and operationally unreliable ROKAF ground-support capabilities.
8. The role and structure of the ROK navy are independent of the proposed air and ground re-orientation. Relational changes in the ROK navy are, however, desirable, to enhance its utility and to reduce costs, thus releasing resources for more important military needs.
9. The force structure required by the proposed relational strategy would correct the deficiencies here noted, and in the process it would release the resources needed for the change. More combat forces could then be formed, in particular "mountain" or agile "light" infantry units with at least some gun- and transport-helicopter support. For arms control and regional stability the alternative structure would have the advantage

* See I.B.(iii)(a) below.

of being less provocative. This does not, however, mean that it would be weaker in tactically-offensive capabilities. On the contrary, it would be very much stronger in that regard.

10. In what follows, the equipment implications of the alternative relational strategy are discussed in considerable detail. On the other hand, there is no discussion in this section of the tactical nature and operational use of the "agile light infantry" component of a relational defense, since this is defined more appropriately in Part II.B.(iii) below. (Tactically and operationally there is no substantive difference between "mountain" infantry and an agile light infantry, while both differ fundamentally from a firepower-dependent positional infantry.)

I.B.(iii) TACTICAL ELEMENTS AND EQUIPMENT CHOICES

(a) Air Power

1. Under the present defense plans for South Korea, great emphasis is placed upon the firepower content of tactical air power to redress the North Korean superiority in ground manpower, armor and artillery. But a detailed analysis of the proposed tactical employment of the ROK air force casts doubt on the wisdom of such reliance and suggests that its large share of ROK F.I.P. funds (approximately three-fifths, prorated) is not necessarily justified.
2. The missions of the ROK Air Force are stated as:
 1. To deter North Korean aggression in general and air attack in particular
 2. To maintain the security of ROK airspace
 3. To support ROK army units in the field
 4. To carry the war to North Korea

It is mission (3), the support of the army units on the battlefield that is driving the ROKAF F.I.P.

3. Current planning is based upon a short-war assumption; it is assumed that a North Korean offensive will take the form of a massive armored assault down the Seoul invasion corridors. Because of the overall firepower advantage possessed by the North and the attacker's putative advantage of the initiative, numerous studies have indicated that there is a short-fall in the firepower believed to be needed by the defense. Much of the F.I.P. is designed to overcome this deficiency by giving the ROKAF a major ground support capability, such as that now possessed by the USAF.
4. This approach can be challenged on numerous grounds.

First, it is dangerous to rely upon air power to make-up for deficiencies on the ground. Airpower in this role is too dependent on the vagaries

of weather and EW uncertainties. Tactical airpower should be seen as an adjunct to the ground force (as in all maneuver systems) rather than the reverse.

Second, the short-war premise is at odds with the parallel assumption that close-air support (CAS) and Battlefield Interdiction* (BI) can make a major contribution to the defense. Such a contribution would require an immediate commitment of airpower on a very large scale. But such an immediate commitment runs counter to the presumption that the establishment of air superiority and air-defense suppression must come first. Here, then, there is either a basic inconsistency in the war plan, or else an immediate commitment of USAF and USN airpower on a very large scale is assumed. This cannot be taken for granted by the ROK, or even promised by the U.S. because priority commitments elsewhere might fatally delay deployments. From the U.S. viewpoint such a requirement also pre-empts a key U.S. political decision, by forcing an immediate escalation of the war, and of the U.S. involvement in its conduct. It follows, therefore, that if CAS and BI are to be used immediately, a style of air operations must be developed that is relatively insensitive to enemy fighters and ground air defenses. This implies operations at very low altitudes, altitudes which are more suitable for guns and cluster munitions than PGMs. And these are not the altitudes for which (low-wing loaded) American aircraft have been designed. By contrast European aircraft (Tornado) and air operations have been optimized for such altitudes.** But the European style is not suitable for operating in the deep valleys of the Seoul approaches: these greatly restrict the flight paths of high speed aircraft, thereby increasing their vulnerability to optically guided automatic weapons. Accordingly the style of tactical

* CAS can be defined as air attack for the immediate support of engaged forces; BI is meant to prevent the movement of forces (generally reserves) in the area behind forward units. The first requires close coordination with forward units, the second does not.

** For a detailed discussion of these issues, see S.L. Canby, "Tactical Airpower in Armored Warfare: The Divergence Within NATO", Air University Review, May-June 1979.

air operations in Korea should be of a distinct (third) variety if CAS and BI are to be used to good effect in a short war. This calls for low-altitude operations with slower but more maneuverable small aircraft in larger numbers.

Third, the plan ignores the time needed to establish smooth and effective forward air-control (FAC) coordination. In past conflicts, this process has taken weeks,* rather than the hours envisaged in the ROKAF plans. Where both U.S. and ROK troops are involved, the language barrier will intensify the difficulties of FAC.

Fourth, the use of aircraft for close air support, as envisioned in ROK defense plans, uses air power as a substitute for artillery and obstacles. This is a basic misapplication of tactical air power, which should rather serve as a complement for the artillery: to strike at areas not covered by artillery fire (or where FOs are not present) and to provide surge firepower for moments of crisis, or for suppressive purposes in support of an advance (when artillery is not available or where its concentration prior to attack would cause loss of surprise). But to use it as a direct substitute for artillery on the battlefield, especially along the narrow Korean front, is neither militarily desirable nor cost effective.

5. Supply interdiction, on the other hand, is irrelevant to a short war scenario. The North Koreans would simply utilize prepositioned stocks in fortified (and well defended) forward areas, thereby keeping LOCs short, in effect transferring supply interdiction into Battlefield Interdiction and CAS. There would be no real LOCs to attack at all until these stocks were expended. In the Korean context there is some reason to believe that it is impossible to interdict North Korean supply lines at all. USAF's Operational Strangle, in the Korean War, failed at this very aim.** Of course, it can be argued that at that time the North Korean and Chinese forces were mostly light infantry with logistic requirements much lower than those which would now be needed to sustain an armored offensive.

* Even the Israeli Air Force has only recently acquired an immediate CAS capability (prolonged, episodic operations in Lebanon have created a FAC infrastructure and coordination which could now be utilized directly in a major war).

** See R. Frank Futrell, U.S. Air Force Operations in Korea, 1950 - 1953, for an overview of USAF interdiction campaign in the Korean War.

But that very option to circumvent overwhelming airpower remains available to the North Koreans to neutralize any ROKAF (+ USAF) interdiction campaign. In any case, at present only ROKAF's F-4s are capable of executing supply interdiction operations. Once again, the number of aircraft available is insufficient for the task, unless considerable American forces are involved.

6. Air superiority within the ROK air space by contrast is within the grasp of the ROKAF. But its priority as we shall see is very much contingent on the design of ROKAF offensive air forces and not the ROK's vulnerability to North Korean air attack. While the NKAF outnumbers ROKAF in combat aircraft, the quality of ROKAF pilots and equipment (aircraft, weapons and ground support) is superior to those of the North. It must be recognized however, that obtaining the degree of air superiority needed for supporting some styles of offensive air operations could require all of ROKAF's resources for a period of some days at least. Unlike the air war foreseen for Europe, where temporary or partial air superiority is seen as adequate for offensive air operations (including CAS) to continue, in Korea the area involved is so narrow that even a small number of surviving NKAF MiGs could disrupt all offensive air operations by the ROKAF. Utilizing tactics already developed by the North Vietnamese, one or two aircraft can make attack runs on (large) strike forces, causing them to jettison ordnance. By such hit-and-run attacks (while avoiding aerial combat except when clearly advantageous) NKAF pilots could seriously reduce the effect of ROKAF sorties. Planes would then have to be earmarked for escort and CAP duties (and for defense suppression) and others would have to be used to carry out attacks against NKAF bases. Eventually North Korean Air Forces would be eliminated; in doing so, however, ROKAF could incur such losses and so much virtual attrition as to render its ground support insignificant during this early period.
7. Thus the present and programmed plan of Korean defense implies a heavy reliance upon assets that may be unavailable without a considerable and immediate U.S. involvement. Even if available, however, it must also be recognized that air assets are not a reliable method of offsetting ground force deficiencies, if only because of the vagaries of weather.

8. It is obviously desirable that ROKAF should strive for self-sufficiency as the ROK Army is doing. But unlike the United States, South Korea has neither the resources nor the manpower to develop a large air force dependent upon electronic warfare and specialized EW aircraft. Self-sufficiency and balance must therefore assume a different meaning for the ROK armed forces than those of the U.S. To keep the cost of the air force within bounds while maximizing its capability requires the adoption of a set of mission priorities that are congruent with the true function of airpower, the nature of the threat and the ROKAF's limited budget. Once that is done equipment and organization can be tailored to meet the threat and fulfill the mission in the most economical manner.
9. The Air Threat: the North Korean Force is composed of fighters, fighter-bombers and light bombers, as well as a small number of helicopters and transports. At present the NKAF has approximately 120 MiG-21s of various models while the bulk of the force is composed of MiG-15 and 17s, supplemented by some MiG-19s. These aircraft can function in both the fighter-interceptor and ground-attack mode. The Su-7B, of which the NKAF has 20, is the only modern ground attack aircraft in the inventory. They could be supplemented by some 84 obsolete IL-28 light bombers.
10. Of these aircraft, only the MiG-21s and SU-7s can be considered modern; the MiG-15/17s are obsolescent. As for the MiG-19, although a design more than 20 years old, it is still a formidable fighter, but it lacks all-weather (or any substantial ground attack) capabilities. None of the aircraft in the NKAF have the range, payload or avionics (angle-rate bomb systems, blind bombing systems, terrain following radar, inertial platforms, ECM, etc.) required for ground attack missions in high-threat environments.
11. NKAF pilots are trained along Soviet lines in the USSR. They rely heavily on positive ground control (PGC). They tend to fly by the numbers and place more emphasis on correct flying procedures and formation-keeping than on air combat maneuvering. Trainees seldom fly air combat training missions. Instrument flying is avoided. All training flights are carefully rehearsed with trainees first "walking through" maneuvers using model aircraft.

12. As a whole, this training regime results in competent technical but poor combat pilots. Aggressiveness and individual initiative are in effect trained out. Use of stereotyped tactics leads to predictable results: in Vietnam, the Middle East, and Ethiopia, North Korean pilots have been equally undistinguished.
13. NKAF pilots have difficulty developing the required level of combat proficiency during their service period. They fly an average of only 100 hours per year (USAF and ROKAF fly at least 250 hours). No training is given in low-level bombing or evasive techniques; their Soviet-based doctrine prescribes medium-level attacks. The lack of navigational skills tends to result in high-level flights with no course deviation, which simplify interception. Although there may be some excellent North Korean pilots, as there were during the Korean War (the Honcho pilots), the average quality of NKAF pilots, and aircraft, are alike inferior to their ROKAF counterparts.*
14. The NKAF has a well-developed ground organization. There is a comprehensive warning and tracking system, integrated with a GCI system. On the other hand most of its permanent airbases are located too far north to allow deep penetration of ROK airspace. But most Soviet designed-aircraft have the ability to operate from roads and unprepared fields, albeit with reduced payloads and slower turnaround time, and wartime forward deployment would thus have to be anticipated. On the average, a rate of 2 - 3 sorties per day could be maintained in forward deployments. Ground crews are believed to be competent and should be able to support combat operations.
15. In sum, the NKAF is presently equipped and organized mainly for air defense and does not present a serious ground threat to the ROK. It lacks the payload and range to make serious ground attacks against ROKA forces in time of war. The purpose of the NKAF is essentially strategically- and tactically-defensive: to prevent the ROKAF (and U.S. airpower) from making quasi-strategic attacks and from supporting ROKA operations. These it could do very well, in spite of its technical inferiority by

* Conversation with Taoka Shunji, Defense Editor, Asahi Shimbun; "How Good is the MiG-21?" by Mark Lambert, Naval Institute Proceedings, January, 1976.

hit-and-run feint/interception tactics. It would not be necessary to destroy large numbers of ROKAF planes; interference with the delivery of air-ground ordnance is sufficient. In the long run the NKAF must be defeated, but their hope would be to maintain a stalemate until ROK forces have been defeated on the ground..

16. Some NKAF ground attack sorties would be made, but these would only be a minor nuisance. North Korea, like the USSR and Egypt, rely more upon artillery than airpower for fire support.
17. Another function carried out by the NKAF would be the delivery and resupply of infiltrator groups into the South. For this purpose it has a number of AN-2 COLT light transports, each of which can carry a fully equipped squad. Flying low and slow, they could avoid radar detection and their STOL capability would allow them to land on fields and roads in remote areas.
18. North Korean (ground) air defenses are large and well organized, though by no means as sophisticated as those once found in ROUTE PACK 6 in Vietnam or on the Golan and Suez fronts in 1973.
19. At present, only one type of long range SAM, the SA-2 GUIDELINE is in operation with the NKAF. It deploys 250 launchers, organized into 29 battalions. These are centered around Pyongyang, and protect airfields, and other fixed, high-value military and industrial targets. The SAM-2 is now an obsolete missile, and almost ineffectual against the comprehensive ECM available to the USAF, if not necessarily to the ROKAF.
20. The AAA (Anti-Aircraft Artillery) threat is much more serious. North Korea deploys more than 5,000 AA guns ranging in size from 100 and 85mm through 57, 37 and 14.5mm. The 85 and 100mm guns are mostly deployed in fixed sites (probably hardened) around high value targets; they are radar-directed and linked into the ground reporting and tracking system. They are a formidable obstacle to safe movement in the airspace they

control, and must be either avoided (by flying under their engagement envelope) or else neutralized (by ECM, anti-radar attacks, or attacks on the sites themselves). Unless dealt with, the heavy AAA will force aircraft to operate within the low-altitude light AAA envelope, which could prove as dangerous (if not more so) than the heavy AAA.

21. At present, only one self-propelled (tracked) AAA system is in use with the NKA: the ZSU-57-2. This is an old vehicle, which has been replaced in the first-line Soviet inventory by the ZSU-23-4. Its lack of a radar limits its effectiveness against low-flying aircraft.
22. The remainder of the light AAA in the NKA is towed. They must be unlimbered before firing, limiting them to overwatch in covering moving formations. Nonetheless, if employed on a narrow front, the density of their fire would make attacks against the formations they are defending very hazardous indeed (particularly for aircraft forced into the valleys to obtain adequate target acquisition for PGMs).
23. Additionally, the NKA has the SA-7 (GRAIL) man-portable SAM. These can be carried in vehicles or by individual soldiers. Although it has limited single-shot kill capability against modern jet aircraft, when fired in large volumes it can seriously interfere with air-ground operations. Additionally, they are lethal against helicopters, except those flying in a nap-of-the-earth flight mode which sharply reduces the envelope of vulnerability.
24. If a NKA offensive develops as ROK plans now envision, then it would be very difficult for current ROKAF equipment to cope with the heavy AAA defenses they would find across the DMZ opposite the invasion corridors to Seoul. Certainly a very large number of aircraft would be damaged or destroyed, unless considerable efforts were devoted to defense suppression. But a suppression campaign would detract correspondingly from the ROKAF's ability to execute its CAS and BI functions, given the limited resources currently available.
25. On the other hand, under the alternative threat assumption here investigated, small, light-infantry units acting independently in rough terrain would not

be able to mount a serious counter air defense. The inability of AAA to accompany them would limit their AA weapons to heavy and light machine guns and their lack of logistic support would allow only a small amount of ammunition to be carried. Thus the threat posed to attacking planes would be minimal. Even when employing the SA-7, small light infantry units pose only a marginal threat to fixed-wing attack aircraft. Units could only have a small number of missiles with them; they would be quite unable to engage in the mass salvo firing which gave the missile its effectiveness in Vietnam or the Middle East. But this scarcely matters: the primary-and fully sufficient - defenses of such light infantry units against air attack would instead be concealment and dispersal. And once in contact with ROK ground forces, they will move into very close proximity, making air attack most difficult.

26. Thus, as ROKAF is currently equipped, it cannot successfully meet either the currently perceived threat (due to lack of suitable aircraft and enemy air defenses), or the alternative threat (due to its dispersed nature). The ROKAF obviously needs a new aircraft, but which? The armored thrust scenario would appear to call for an aircraft able to operate in a high-threat environment, with significant anti-tank and point-target capabilities, as well as at least some air combat capability. Ideally, such an aircraft would also need some deep strike potential as well, and this of course requires good avionics suites, high cruising and attack speeds, and a long range. In addition, (as it was assumed in the Korean F.I.P.) the deployment of such aircraft would also require dedicated CAP and defense-suppression forces. Since the F.I.P. was designed, the preferred USAF mode of operations has shifted to low-level self-contained action similar to that of the RAF. This eliminates much of the former need for CAP and defense suppression, but it must be remembered that in the Korean terrain flight paths will be more predictable and turbulence will be somewhat greater.
27. The alternative light infantry scenario by contrast calls for slow-moving, highly maneuverable aircraft able to fly at very low altitudes (to acquire even concealed targets and avoid small arms fire). Against light infantry or infiltrators, it need not have sophisticated ECM or

avionics, nor does it require air-to-air capability. It does need good endurance (for loiter) and a relatively good payload. Rather than using PGMs against point targets, it would rely on strafing, CBUs, napalm and FAEs against its area targets of dispersed infantry utilizing the terrain for concealment and protection. Against the following mainline infantry, targeting will be simpler but air defense will be correspondingly stronger. Its requirements are not demanding.

28. Current modernization programs are designed to bring ROKAF closer to the NKAF in terms of numbers, and all ROKAF plans assume that a normal North Korean offensive would take the form of an armored thrust. Thus particular attention has been paid to systems with a specialized anti-armor mission.
29. Additionally, a letter of agreement has now been signed to permit the building under license of 68 F-5E aircraft, to replace the old F-86s and F-5As still in the ROKAF inventory. This would give ROKAF considerably improved air-to-air and some additional air-ground capabilities, but it does not solve the problem of the ROKAF's inadequacy in CAS and BI capabilities, nor does it address the alternative threat.
30. It is generally agreed that ROKAF must acquire some specialized ground attack aircraft, or alternatively, AHs. In the past there has been interest expressed in the A-10A aircraft. This would certainly provide a specialized anti-armor capability, but for reasons of cost, capability and mission requirements, the A-10 is almost totally unsuited for Korean operations.
31. The A-10 was supposed to have been built around the GAU-8 armor-piercing cannon; but as actually built the additional requirements for hard points and loitering have led to a very large and slow aircraft, which, to survive, must be extensively armored. It is in general maneuverable at low altitudes but it lacks the thrust for low altitude maneuver in mountain valleys. In addition the large signature and size of the A-10 almost guarantees it will be seen and hit. While its armor will protect vital components from AAA up to 23mm, and its redundant systems guarantee that a single SA-7 cannot destroy it, any damage thus sustained will have to be repaired before the aircraft can be cleared for another sortie.

32. The A-10 can carry a maximum of 12,000 pounds of ordnance, but under combat conditions it seems that its load will only be half as great. (Under short field conditions it carries only four Mk. 82 LDGPs and 750 rounds of ammunition, or, alternatively 4 - 6 Maverick EO guided missiles.)
33. The success of the A-10 as a weapons system depends heavily on the GAU-8 and the use of PGMs to destroy armor. It has a build-in laser designator system, and also an electro-optical designator; it can fire the full spectrum of air-delivered PGMs. But such a heavy reliance upon PGMs in the Korean context is not a practical proposition. Terrain conditions make line-of-sight PGMs difficult to use effectively. During a large part of the year, rain, fog and snow will sharply reduce the efficiency of PGMs. PGMs are difficult to use at low-levels in the valleys and medium-level flights are out of the question until air defenses have been suppressed.
34. The A-10 lacks the flexibility to take on roles other than close support. Additionally, to survive it must fly under conditions of air superiority. Using hit-and-run tactics, the NKAF could systematically force the abortion of A-10 strikes.
35. Considering this limited capability, the price of the A-10 is inordinately high: approximately 10 million dollars each, including spares and support. Moreover, the purchase of the A-10 implies the purchase of large numbers of expensive PGMs like Maverick and HOB0. Additionally, its main use to the ROKAF is against the currently perceived armor-thrust threat. The A-10 is not suitable for coping with the precursing light infantry of the alternative threat. Its bomb toting capacity, however, would make it useful against massed infantry.
36. The high cost means that the ROKAF would only be able to purchase a small number of A-10s, insufficient in themselves to meet the armored threat, while foreclosing the possibility of purchasing another aircraft to meet alternative threats.
37. Attack helicopters offer one alternative to the A-10. AH enthusiasts claim that the use of pop-up tactics minimizes their exposure to AAA

and SAMs, while being more survivable against air opposition. While in part this is true, AHs are not a full substitute for fixed wing aircraft. They can only be employed in the CAS role, and that too only in a low-to-medium-threat environment. They are extremely vulnerable to SA-7s and small-arms fire. Against the armored threat they would be a useful adjunct to fixed-wing aircraft, but cannot supplant them. By contrast, against the alternative light-infantry threat they would be extremely useful. But their relative vulnerability and limited payloads would require a relatively large force. And the price of most AH systems is by no means low. In addition to equipment costs and support, ROKAF or ROKA would have to develop an entire corps of helicopter pilots and WSOs to operate them. Therefore, it seems that the AH is not the solution to ROKAF's procurement problems, unless that is, new low-cost models are developed.

38. If ROKAF is to be able to meet both the armored threat and the alternative threat with equal facility and maximum economy, while simultaneously retaining a sufficient air superiority and deep interdiction capability to guarantee the safety of ROK forces from air attack and for threatening vital targets in North Korea, it must develop a different kind of force-structure. The present approach would result in a force too expensive, and unlikely to be effective. If armor is to be attacked directly, then aircraft such as the Vought A-7 Corsair, the upgraded Northrop F-5 or other suitable "FX" aircraft are needed. The A-7 has full interdiction capabilities, while the new F-5G would only be suitable for shallow interdiction (being of course optimized for air-to-air). But at present the best way of handling the armored threat is to do so indirectly, by attacks against soft components of the armor force with light-attack aircraft e.g., the Cessna A-37B Dragonfly.
39. Either approach would provide the ROKAF with a significant augmentation of its capabilities in areas where it is currently deficient. In the case of the A-37B, it would allow F-4s to concentrate fully on air interception and deep attack.

40. The A-37B is an attack development of the T-37 trainer in which many ROKAF pilots were trained. Unlike many trainers which have some supplementary strike capability, the A-37 is a purpose-built attack aircraft. It excels in the COIN and anti-personnel CAS role, as the experience of Special Operation squadrons in Vietnam proves. It can carry up to 5,600 pounds of ordnance, including LDGPs, Snakeye bombs, napalm, CBU's, FAEs, rocket pods, gun pods (including 30mm) and (through the PAVE NAIL system) laser-guided bombs. It has an internal 7.62mm mini-gun, an ideal anti-personnel weapon (it could also be armed with Hellfire and possibly even the 4 barrel anti-tank GE POD 430). It has good loiter capability, is capable of air refueling and good short field performance. While not particularly fast by jet standards, it is faster than the A-10, in maximum, cruising and attack speeds. It is a very small target, and supremely maneuverable. It has small radar cross-section and IR signatures. While not armored like the A-10, it has great survivability, gained by evading fire, rather than flying through it. In Vietnam, A-37s flew 165,000 combat sorties for a loss of only three aircraft.* Although lacking sophisticated avionics, A-37s are cleared for night combat operations and bad weather low level attacks, using their high maneuverability to avoid obstructions.
41. The A-37 utilizes a version of the J-85 turbojet, similar to the engine used in the F-5. Thus maintenance and spares problems would be simplified.
42. The A-37 can be used for a variety of roles, including trainer, target designator and FAC. While not capable of deep interdiction, A-37s would provide a cheap, capable force for dealing with low-technology enemy threats, as postulated in the alternative threat. Against armor, it will be effective against the non-tank elements of the armored team, its precursing elements, and the tank itself in the post breakthrough stream when the lack of air defense will permit attacking the tops of tanks with 20mm and low velocity 30mm cannon.
43. Another role which the A-37 could fulfill is that of helicopter destroyer and as a fighter for destroying infiltrating AN-2s. Few other aircraft have the maneuverability to fulfill these functions.

* "The Littlest Attacker", by Don Sims, Air Combat, March 1980.

44. In terms of cost the A-37 is inexpensive, with a unit procurement price of one million or less, including spares, support and replacement. In terms of acquisition costs alone this means more than ten A-37s could be procured for the price of one A-10.
45. Therefore, the following alternative plan is suggested for ROKAF modernization. This would not introduce new technology into the area and indeed it would not rely on hyper-advanced technology for its efficiency; it would be lower in cost than the force now envisaged, and would also be more closely tailored to the actual conditions of the Korean peninsula. This plan would require that the ROKAF continue to replace F-86 and F-5As active with co-produced F-5Es, while, instead of purchasing several squadrons of A-10s, the ROKAF would purchase many squadrons of A-37Bs.
46. Under such a re-equipment program, ROKAF would be much better placed to meet any North Korean attack, while at the same time releasing funding for strengthening the real ROK deficiency - the army.
47. The F-4 Phantoms would be employed primarily as deep-strike and interdiction aircraft, with a supplementary role as a long-range fighter for sweeps; and for emergency surge. Upon the outbreak of conflict, F-4s could attack all NKAF airbases south of Pyongyang, thus limiting the depth of North Korean penetrations of ROK airspace. Throughout the conflict, flights of F-4s could be used as needed to keep these fields out of commission. Other F-4s will engage in fighter sweeps over the North, harassing enemy fighters in their own territory. Additionally, F-4s can be used to attack any high priority targets that might present themselves in strongly defended areas, including NKA troop concentrations, traffic choke points and supply dumps.
48. The F-5s would be used almost exclusively in the air superiority mode. They can preclude NKAF penetrations south of the DMZ, and protect ROKAF units engaged in CAS and BI duties. Additionally, they can execute fighter sweeps in the southern portions of North Korea, with the aim of quickly destroying the NKAF's ability to interfere with air and ground operations. Once this is achieved, F-5s could be released to supplement other aircraft in the ground-attack mission.

49. The A-37 force is most suitable for attacking light infantry under the alternative threat scenario. Its task would be to seek out and destroy enemy infiltration groups in conjunction with ground forces, aeroscout units, and FACs.
50. Under the armored thrust scenario, A-37s would attack the armor as stated in Paragraph 42. Many observers believe this is in any case the most productive method of attacking armor.* Second, A-37s could serve as a quick-reaction force to deal with small-scale armored breakthroughs, so that higher capability aircraft need not be diverted from their missions.
51. In conclusion, it appears that the present and programmed structure of ROKAF is incapable of meeting its assigned missions. First because equipment levels are too low, and second, because mission requirements are much too ambitious. Rather than demand that airpower provide much of the indirect fire support, more reliance should be placed upon conventional artillery, mortars and mobile rocket launchers. CAS is simply too unreliable, especially in the early stages of a war, to be the basis of a theatre defense. On the other hand, airpower has a definite value in any defense scheme for South Korea. It can bring fire to bear in areas not covered by artillery, it can provide surge firepower in emergencies, attack targets of opportunity, and project the war into the North, any/all this in addition to its indispensable function of gaining and keeping air superiority.
52. The current re-equipment program for ROKAF concentrates too heavily on acquiring purely anti-armor capabilities (either through the A-10 or the AH) at the expense of flexibility, and at a high cost. Rather than acquiring a high-priced force which will add capabilities in only one mission area, the ROKAF should strive for robustness across the spectrum or possible scenarios and acquire a force capable of meeting a wide variety of threats. To this end, the acquisition of low cost A-37s will provide greater capability against the armored threat for a lower cost than the A-10 or AH force.

* For a discussion, see S.L. Canby, The Contribution of Tactical Airpower in Countering a Blitz: European Perceptions, Technology Service Corporation, May 1977.

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This approach of increasing ROKAF capabilities but at the same time reducing the dependence of the ROK army on airpower should enable the ROK to defend itself, in turn reducing its dependence on U.S. forces, airpower in particular.

(b) Ground Fire Support

1. The very great reliance of the ROK army's defense on indirect firepower accurately reflects their U.S.-style attrition approach to warfare. Current and envisaged programs would entail the procurement of additional field artillery as well as large numbers of U.S.-built mortars. Additional field artillery procurements would further increase the already pronounced specialization of the defense against the threat of an all-out (i.e. deeply echeloned) offensive down the Seoul corridors. As far as the alternative threat is concerned, the rugged terrain of the FROKA sector, the resulting difficulties of movement for heavy weapons (and the scarcity of flat terrain suitable for emplacements) would seriously diminish the effectiveness of howitzers in opposing multiple attacks by dispersed infantry formations.
2. Terrain restrictions on the movement of heavy tracked vehicles (as well as the shortage of suitable off-road firing positions) mean that even tracked self-propelled artillery would not perform well in the FROKA sector. Reliance on pre-deployed towed or SP artillery presents less of a problem in the I Corps Group sector, but further acquisitions of tube artillery would do little to enhance the versatility of the defense against the less obvious threat.
3. Mortars and multiple rocket-launchers, are much more easily moved and emplaced (and have higher rates of fire) than the howitzers now being bought. These cheaper weapons are likely to be distinctly more useful in opposing attacks whose axes cannot reliably be predicted in advance.
4. Of Mortars: it is well known that the Korean terrain heavily favors the high-angle fire of mortars, which can often reach reverse slope targets denied to howitzers and guns. Nevertheless the current procurement of large numbers of U.S.-built 50mm, 81mm, and 4.2 in.

(107mm) mortars by the ROK is questionable. Since the U.S. Army attributes little importance to these low-cost and technically unexciting weapons, American mortars do not compare well with some of the mortars available from other suppliers.*

5. For these reasons, the ROK's continued dependence on U.S. mortars should be reconsidered. The emphasis on mortars within the ROK ground forces ought to be as high as in the German, French, and Israeli armies; and the ROK should have weapons as good as those armies (and incidentally as good as the Soviet-pattern 120mm and 160mm mortars used by the North Koreans). In any case, mortars should be organizationally consolidated within the infantry, and the inventory upgraded to larger calibers. (The smaller calibers can now be replaced by grenade-launchers.) Such a consolidation would release considerable manpower, to provide for instance new units capable of complementing existing mainline units and coping with the light infantry threat.
6. The adoption of modern 120mm and 160mm mortars, with their superior range and more effective ammunition, would open the way for a partial substitution of mortars for the (much more costly) 105mm howitzers now being bought. The U.S. M-101 105mm howitzers already in the ROK inventory (and planned acquisitions) should be replaced in large part with 120mm mortars (or larger-caliber gun-howitzers).

* Thus the U.S. 4.2 in. is both heavier and less capable than the 120mm mortars now produced in West Germany, France and Israel. The firing weight of the 4.2 in. is 290 Kg., its bomb weighs 11.9 Kg. and its maximum range is 5.49 Km., versus the French AM-50's 242 Kg., 13.8 Kg., and 6.55 Km., the Franco-German 120mm B's 260 Kg., 13 Kg., and 6.7 Km., and the Israeli Soltam 120mm's 225.60 Kg., 12.8 Kg., and 6.5 Km. In addition, the Israelis also make a 160mm mortar that weighs 1700 Kg. and fires a 38.5 Kg. shell to a maximum range of 9.3 Km. Of particular interest for "fire-brigade" deployments are the light mortars, such as the Israeli 120mm light "T", which weighs 135.7 Kg. and fires a 12.8 Kg. bomb to 6.2 Km., and the French MO-120-60 which weighs only 92 Kg. and fires a 13.8 Kg. bomb to a range of 4.7 Km. (or 6.85 Km. with boost). The inferiority of U.S. equipment in this class of weapons (a natural result of its low priority in the U.S. Army) applies across the board. Thus the latest U.S. 81mm mortar (M-29) is heavier (48.5 Kg. viz. 39.2 Kg.) fires a lighter bomb (3.3 Kg. viz 3.86 Kg.) and has a shorter range (3.86 Km. viz 4.1 Km.) than the Soltam short-barrel 81mm.

7. The specific terrain and operational conditions of Korea should in any case result in a higher proportion of mortars and a lower proportion of howitzers than in the present force structure, which has obviously been excessively influenced by U.S. equipment preferences and organizational formats. If effective modern mortars were acquired, the ROK force-structure would then be better adapted to the local environment, and considerable net savings should result.
8. Of Multiple Rocket Launchers: Even if the alternative theatre strategy were to be rejected, multi-tube "barrage" rocket launcher (MRL) should be deployed. These weapons, much used in Soviet-style forces are now also being developed by the U.S. (GSRS). Since MRLs are unguided and have high CEPs, they can only be used effectively against mass targets, such as maneuver forces assembling or moving in the open; or for suppressive fire in support of counter-attacks. In such functions MRLs substitute for CAS to some extent. The size and weight of the re-load rockets rule out sustained fire; however in Korean conditions they could still substitute for part of the programmed buy of tube artillery since much of it is to be used primarily for massed time-on-target (TOT) fires. Surge requirements should be met by surge weapons, not by aggregating large numbers of expensive tube howitzers.
9. While their re-load is always a problem, multi-tube rockets launchers offer capabilities. By providing single volleys of extremely intense fire, multi-tube rocket-launchers can be a more reliable (and much cheaper) substitute for CAS in certain tactical conditions.
10. MRLs are especially effective against assault forces advancing across open ground in the attempt to "rush" frontal defenses. MRLs can also be used at long ranges to disrupt maneuver forces assembling in the rear. When deployed in fire-bases with ample re-loads, MRLs could provide an organic reserve of fire-support, to be activated only in difficult tactical situations, or to exploit special opportunities. Owing to their highly visible and very audible mode of operation, MRLs have a particularly powerful morale impact.

(c) Anti-Armor Capability

1. In the first days of the Korean War, a North Korean force of just 150 Soviet T-34 tanks played a prominent part, if only because of the initial inadequacy of ROK (and U.S.) anti-tank weapons. At present the North Korean inventory includes a large number of tanks, including 350 T-34s, 1,800 T-54/T-55s and T-59s, as well as smaller numbers of light tanks (Chinese Type 62s and Soviet PT-76s). This larger tank inventory does not simply present a 1950-type tank threat writ large. North Korean armor is now in part tactically integrated with other arms, in combined-arms forces. A modest supply of effective anti-tank weapons would have solved the whole problem of the T-34s in 1950 but the mere availability of such weapons would not now suffice to cope with the threat.
2. As suggested above, because of the formidable tank barriers built by the ROK, the function of the tank in North Korean war plans may now have changed. To some extent, North Korean tank forces may now play the role of a strategic decoy, intended to attract the attention (and the resources) of the defense, while the primary arms of initial combat would in fact be the light and regular infantry (as well as the artillery).
3. Obviously under whatever theatre strategy the ROK's defenses must still be able to defeat North Korean tank forces. But this operational requirement cannot be met by simply deploying anti-tank weapons in numbers proportionate to the number of North Korean tanks. Even in Korea's highly constricting terrain, the essential quality of tank forces is their ability to concentrate in superior numbers at chosen breakthrough points, achieving decisive local superiorities even if no numerical superiority obtains front-wide.
4. To defeat the perceived "Blitzkrieg" threat, it is neither necessary nor sufficient to destroy a high proportion of the AFVs involved.

It is not necessary to do so, because the success of the deep-penetration armor operations depends on momentum (rather than firepower) so that if the pace of the advance can be slowed, and then stopped, the enemy attack can be defeated even if many of the AFEVs remain undestroyed. It is not sufficient to destroy large numbers of tanks because if the enemy can maintain momentum, the resulting penetration may succeed in breaking the cohesion of the defense (thus precipitating a collapse) even if a high proportion of the tank force involved is lost in the process. In high-speed armored warfare victories have frequently been won by a handful of surviving tanks, which reached key positions in the enemy's rear, thus breaking the command-integrity and logistic network of the defense.

5. For this reason, it is normally more useful to slow down the tank force as a whole, than to destroy some part of it and it may be more useful to destroy the small number of "high-leverage" tanks (i.e., those which are about to reach key positions) than to destroy a much larger number in the undifferentiated mass of the enemy inventory.
6. Of Minelet Systems: In view of the above, consideration should be given to the acquisition of anti-tank minelet-dispensing systems as an alternative to specialized anti-tank aircraft or AHs. The choices include minelet cluster-bombs or dispensing canisters, artillery-fired multiple minelet munitions, and rocket-delivered systems.* Very small minelets (too small to destroy tanks) are the most effective to rapidly create obstacles to movement. Sensitive anti-personnel versions can be mixed with hollow-charge AT minelets to impede clearing operations but minelet-minefields can still be cleared fairly easily if not covered by defensive fires (the requisite equipment is already in the Soviet inventory). Even so, minelet obstacles could still break the momentum of an armor attack very effectively. Minelets would be

* For example, the West German 110mm LAR rocket, primarily used for anti-tank minelet delivery in the West German army has a range of 15 kilometers, delivering twenty mines per rocket.

particularly useful in opposing multi-wave armor attacks. If delivered on the enemy's access routes during a tank attack, they can delay the follow-up attack, thus giving time for the defense to prepare itself.

7. The Soviet offensive armor doctrine which may safely be imputed to the North Koreans assumes that anti-tank defenses are to be suppressed, swamped or outflanked rather than destroyed piecemeal by aimed fires. By delaying the flow of armored vehicles reaching the axis of intended penetration, minelet systems can defeat these tactics. Specifically minelet obstacles could limit the flow of incoming enemy vehicles to match the engagement capacity of the anti-tank weapons of the defense. They can also slow down the tempo of out-flanking movements thus giving time for counter-moves. In this specific role, MRLs amount to a partial substitute for (much more expensive) air capabilities.
8. Of Anti-Tank Guns: the ROK is now in the process of acquiring large numbers of (TOW) anti-tank missiles. The ROK did not procure ATGMs until U.S. types became available - some two decades after the IOC dates of the first European anti-tank missiles. As in other areas, the ROK army has followed U.S. Army preferences in anti-tank weaponry. Thus it deploys recoilless weapons (57mm, 75mm, 106mm) and "bazooka" type rocket launchers, while ignoring other kinds of anti-tank weapons, widely used in Western Europe and in the Soviet forces.
9. In particular, the ROK has no light-weight low-pressure AT guns. To be sure, these cheap weapons cannot compete with the precision guidance and definitive lethality of TOW or Dragon. On the other hand, they are operable in conditions where anti-tank missiles cannot perform well; in fact their particular advantages happen to complement very exactly the specific shortcomings of anti-tank missiles. Most important, these guns are also effective against soft targets, including enemy infantry - unlike TOW or Dragon.

10. AT guns in general have much higher rates of engagement than ATGMs. Secondly, while the latter are inoperable at very short ranges, guns are then particularly effective. Conventional high-velocity AT guns (as used by the North Koreans) have these virtues, but since they destroy armor by kinetic energy, they are also heavy (the high recoil forces prohibit the use of light-weight mounts). But nowadays light-weight AT guns are also available; these use chemical rather than kinetic energy, firing hollow-charge (HEAT) or squash-head (HEP) ammunition. For example, while the British high-velocity (1,450 m/sec.) 105mm gun now standard on U.S. tanks must be mounted on a vehicle of at least thirty-five tons, much lighter (and cheaper) weapons are now available. For example, the Belgian Cockerill 90mm gun can be mounted on a four-wheeled armored car and its HEAT rounds will still kill a tank at ranges of up to 800 meters.
11. In Korean conditions, the combat value of light gun-armed vehicles (whose armor offers protection only against small-caliber ammunition) could be considerable. From hull defilade, such vehicles could engage tanks directly and their relative cheapness would allow many to be deployed to set up flanking-fire positions (a standard anti-tank technique in all the European armies). In the FROKA sector, against light infantry, such vehicles could form the nucleus of expedient strong-points; they could provide road escorts against the ambush threat, and could serve as stand-off (i.e., beyond RPG-7 range) weapon platforms to support ROK infantry attacks against infiltrated North Korean light infantry.
12. Low pressure 90mm guns firing HEAT ammunition mounted on armored cars could complement TOWs very well, by offering high rates of fire and good close-in capabilities. Mixed TOW and light-gun AC units could engage tanks and other armored vehicles much more reliably than TOWs alone. The effectiveness of such mixed units would not be drastically reduced when terrain, weather (or smoke) impede long-range ATGM engagements. By contrast in such conditions, a TOW-only defense could be easily swamped by a high-speed armor attack.

13. In an AC configuration, low-pressure 90mm guns would still not cost more than a fraction of MBT costs, while the cost of the individual rounds is very much less than the cost of TOW missiles. Since the possible targets include light-armor and "soft" vehicles as well as infantry, ammunition costs are particularly important.
14. Low-pressure guns have effective ranges of less than 1,000 meters. But in Korean conditions it is doubtful whether there would be a high proportion of longer range engagements. At ranges of up to 1,000 meters even the lightest of the light guns, the Cockerill 90mm gun, would still be highly accurate. Further, while the lethality of the TOW warhead is almost twice that of a 90mm HEAT round, the latter can still penetrate up to 320mm of armor in optimal conditions, and should in fact suffice to achieve a high rate of kills. (The maximum armor of T-54s/T-55s and T-59s does not exceed 120mm.)
15. The reality of tactical conditions further narrows the difference in accuracy and lethality, while enhancing the rate-of-fire advantage of gun systems. Even the advanced TOW requires the operator's full attention throughout the engagement; by contrast a gunner need only sight his target once (i.e., fire and forget). In the presence of smoke and distracting fire this is a much more important consideration than is often realized. Current Soviet tactics (as modified after the 1973 war) stress the use of SP artillery and mortars to suppress ATGMs by smoke and H.E. fire. They also stress "rushing" tactics, to exploit the slow rates of missile engagement. Gun systems are inherently resilient against both techniques.
16. Of Tank-Destroyers: neither anti-tank missiles nor towed light-weight guns can overcome the major limitations inherent to all light-weight anti-tank weapons: first, even if mounted in APCs, both light-weight AT guns and AT missiles lack battlefield mobility (i.e., mobility in the presence of enemy fire). Second, HEAT kill effects are vulnerable

to countermeasures, unlike KE effects. Battle tanks, which combine powerful anti-tank weapons with high levels of battlefield mobility are for this reason the most effective of all anti-armor weapons. But battle tanks are very expensive, with the current U.S. version of the M.60 costing about one million dollars per unit. Further, U.S. battle tanks are now in short supply, and could not be delivered in large numbers even to a priority recipient such as the ROK.

17. One possible substitute for the battle tank is the heavy tank destroyer (TD), and this too has counter-maneuver capabilities (unlike lightly-protected or soft AT weapons) and for a much lower cost than battle tanks. Moreover, the ROK's industrial base could produce tank destroyers much more easily than battle tanks. With a limited-traverse gun mounted in a box-like casemate, tank destroyers require neither the large castings nor the complex turret systems found in modern battle tanks. Further, owing to the turretless layout, the profile of gun-armed tank-destroyers can be kept low (e.g. 1.98 meters for the West German JgdPz-K versus 3.29 meters for the M.60 A.1) so that an equal degree of protection can be achieved at a much lower overall weight (and cost).
18. While tank-destroyers cannot immediately engage targets all-round as easily as battle tanks can, by simply revolving the turret, they can still be employed effectively in maneuver operations. Almost as well as tanks, tank-destroyers could disrupt armor thrusts by counter-maneuver operations (i.e., by launching attacks against the vulnerable flanks of an advancing enemy). The ROK now has a fairly large tank force: the inventory includes 60 M.60s, 400 M.47s and 450 M.48s. It is now planned to increase this force, but as noted above, modern battle tanks are very costly and their production requires a more sophisticated industrial base than the ROK now has. A locally-made tank destroyer could usefully add to the needed counter-maneuver capabilities - thus reducing the number of new battle tanks needed. Older tanks (i.e., M-47s) could in addition be modernized and used as TDs.

19. Armor is but one of the threats facing the ROK. Given the extensive fortifications that have been built over the years, North Korean tank attacks are likely to become the salient threat only after the flanks of the barrier systems have been turned, and many of the obstacles cleared. Consequently, the ROK should not overload its forces with weapons suitable only for specialized anti-tank purposes. Emphasis should instead be placed upon multi-purpose weapons which can be used against infantry as well as against armored vehicles. This calls for less emphasis upon ATGMs. The same reasoning suggests that the ROK would be well advised to deploy light-gun ACs and heavier tank-destroyers instead of additional battle tanks.

(d) Ground Air Defense

1. The arguments presented above against overspecialized AT procurements apply in equal measure to air-defense weapons.
2. The North Korean tactical-air threat is not particularly intense, but some modern AD capability is obviously needed. In addition, AD weapons are also needed to defeat North Korean transport helicopters and AN-2 fixed-wing aircraft, which are likely to be used to insert "light" troops (of the 8th Special Corps) into the rear of the battle zone (and to drop supplies to the necessarily load-limited infiltration troops). Given that these light troops could inflict much more damage than their numbers may suggest, the ROK must be prepared to cope with this so far neglected dimension of the threat.
3. At present, the ROK has some 1,000 AAA weapons, these being almost exclusively of WWII vintage. These weapons are effective against slow aircraft of the AN-2 variety and, unlike REDEYE and other missile systems, they are also very effective against infantry at close quarters (e.g., to break up roadblocks set up by infiltrated infantry). Instead of investing heavily in complex missile systems, the ROK could usefully emulate the North in relying on a "virtual attrition" capability in air defense, and this can be achieved by deploying small-caliber cannon and heavy machine guns.

(e) Naval Power

1. The present structure of the ROK navy illustrates the consequences of small-power reliance on big-power military assistance. American naval forces are of course designed for "blue water", war-at-sea operations. They are certainly not specialized for coastal defense. It is therefore not surprising that a ROK navy modelled on the U.S.N. and dependent upon it for hand-me-down equipment is structured for generalized war-at-sea capabilities, while being ill-suited for the specific Korean context.
2. The ROK navy consists of some twenty-two destroyer-sized ships and thirty-three coastal-patrol craft. It has no submarines, and has only a handful of modern fast patrol-boats and coastal mine sweepers. By contrast, the opposing North Korean Navy consists of many (obsolescent) fast attack craft and submarines, supported by a large number of landing craft.*
3. The primary missions of the ROK navy are ASW and counter-infiltration. North Korean submarines certainly pose a threat to the ROK's sea communications. But submarine warfare against the SLOCs is an instrument that cannot be used lightly by the North, since the probability of precipitating U.S. (and Japanese) retaliation is very great. North Korean submarines are obsolescent and could therefore be readily handled by the modern ASW forces of the U.S. (and Japanese) navies. To the extent that the ROK nevertheless desires to have its own ASW capabilities, the emphasis should be on coastal operations, based primarily on the use of land-based ASW systems rather than the much more expensive sea-based systems.
4. The ROK navy must obviously police coastal waters and must secure the coasts against amphibious landings. A large-scale amphibious invasion would imply big-power intervention alongside the North; it could not be mounted by the North on its own. To the extent that the threat of an amphibious invasion is considered a serious threat, the destroyer-class ships of the ROK navy would be of little value. It is notable in this

* Military Balance 1979 - 1980, op.cit.

regard that the Swedish and Norwegian navies (which are mainly oriented to the anti-invasion role) no longer deploy destroyer-class ships at all. In the Swedish navy all such ships have been relieved of wartime duties and are being phased out of inventory; in Norway, such ships would be used only for SLOC-protection and escort duty in the North Atlantic. The best defense against an amphibious invasion is the naval mine, and that calls for (i) minelaying; and (ii) the protection of the mine obstacles by small attack craft within the archipelagos that shield two-thirds of the length of the ROK coastline. Elsewhere, small coastal submarines and in-place coast artillery could usefully serve to hinder enemy clearing operations against the mine obstacles. Such an "archipelago" naval defense would make the populous western coast very difficult to invade by sea. The more open eastern coast would be easier to invade from the sea, but on that side of Korea the road net is poor and the terrain is readily defensible, (Korea's industrial heartland is, of course, on the western coast).

5. The character of the small-scale sea infiltration threat is quite different. The North could infiltrate elements of 8th Special Corps by sea (as well as by air, e.g. by gliders). In wartime, infiltration could be made relatively difficult; aside from an alert ROK navy, infiltrators would have to evade the activated rear-area "Security Divisions" and "Homeland Defense" reserve forces. Mining could further complicate the North Korean task.
6. Counter-infiltration in peacetime and more especially immediately prior to a North Korean land offensive is a far more important task. In this case, there can be no use of mines and the archipelago complicates the ROK's security task, for it reduces radar line-of-sight ranges and complicates all forms of surveillance. The large number of fishing boats at sea at all times means that infiltrators must be sorted out by visual contact. Many small ships (all of which could now have considerable firepower) would obviously be much more effective for such surveillance than the present handful of destroyers, which in any case are very vulnerable to North Korea SSMs.

7. Thus for normal policing and coastal-defense duties, a greater number of fast attack craft would obviously be preferable to the ROK's reconditioned warships of another era, which were designed for sustained operations at sea rather than for coastal-defense duties. In the case of the ROK, the prestige attached to destroyer-sized ships should not be a factor in evaluating their deployment. Except for the North Koreans (who probably cannot be impressed anyway) in North-East Asia there are only Great Powers, and neither the Soviet Union nor the PRC or Japan are likely to be impressed by the old destroyers of the ROK. In fact the Great Powers are much more likely to be impressed by a "relational" ROK navy of fast attack boats and small coastal submarines.
8. The latter would certainly be a useful adjunct to a missile-boat surface navy. New-model diesel-electrics, such as the West German Type 207 with their recent advancements in battery technology, have very good operating characteristics while being still relatively cheap in terms of both investment and operating costs.

II. IRAN

A. THREAT AND RESPONSE, AS WAS

Overview

1. It was the Shah's strategy (in rapid implementation after the oil-price revolution of 1973) to acquire for Iran a full panoply of forces, land, sea and air, that would be qualitatively equal to the best of Western forces.
2. The army, by no means very large with fewer than 300,000 men in all, was to become a fully armored/mechanized force, equipped with high-quality MBTs (chiefly the upgraded Shir/Chieftain) as well as the best available APCs and other armored vehicles. This armor-mechanized core was to be complemented by (i) high-quality battlefield air defenses and (ii) a large number of helicopters.
3. A small intervention force (domestic and regional) of two air-transportable brigades was an adjunct, primarily meant for supportive securing operations. It was the Shah's intent to increase his intervention capability by procuring airlift for his mechanized formations also.
4. As far as the ground forces were concerned, it was assumed that all non-Soviet threats (or targets) and notably a frequently hostile Iraq, amounted to lesser included cases of the Soviet threat.
5. At the theatre-strategic level, while the army was primarily deployed near the Iraqi borders (and Tehran), the force-structure implied the intention of fighting the Soviet army on its own terms, i.e. in armored warfare. At the operational level, this would have required the development of a full-solution combined-arms capability to wage armored maneuver warfare against the Soviet army, which specializes in that task. This corresponded to the theatre strategy which amounted to a "Delay & Wait" scheme, predicated on the swift arrival of U.S. forces to oppose those of the Soviet Union.

6. There was by contrast no attempt to develop a terrain-relational defense, based on the great natural barriers that protect Iran's northern borders.
7. By the time that the Shah fell from power, the Iranian army had acquired only a fraction of the planned inventory, and lacked the skills needed to use what it had, at least in combat with a first-class opponent.
8. As far as the Navy was concerned, the Shah's planned acquisitions entailed the desire to control the approaches to the Gulf, in addition to fighting within it. For the latter task the Iranian navy was fairly well equipped (and trained) by the time of the Shah's fall, having suitable missile boats and other small craft. For the wider task, the necessary warships had not yet been delivered. The evident opportunity of offloading the task (and prestige) of guarding the Gulf approaches to outside Western powers dependent on Gulf oil was explicitly rejected by the Shah.
9. Iranian air force acquisitions were fully consistent with the above theatre strategy, even if its elements were a good deal more visible than the rest. Since the ground forces were meant to fight the Soviet Union in large-scale armored combat, the air force was correspondingly intended to protect the air space as a whole, to protect high-contrast Iranian armored forces and their essential LOCs from Soviet air attacks. (A light-infantry defense of the mountain barriers would have resulted in a much less demanding task for the air force.) Hence the need for high-quality interceptors (F-14s), large numbers of high-quality air-superiority aircraft (F-4s, F-16s), as well as AWACS, to coordinate the whole.
10. Except for the odd item whose acquisition reflected non-military reasons, given the structure and operational mode of the ground forces, the air force was not disproportionate to the whole, even if the whole was undoubtedly disproportionate to the country.

II.A.(i) THE SHAH'S STRATEGY FOR IRAN

1. The Shah frequently declared that the goal of his grand strategy was to make of Iran the leading military power of a region extending from the Levant to India (including the whole of Arabia). But in fact his ground-force deployments had an almost purely defensive and indeed defencist character. In fact, three-fifths of his army was deployed near the Iraqi border (and half of the remainder was stationed around Teheran). In particular, nearly all the armor was deployed towards the Iraqi border, although the Shah's plans did call for the mechanization of the remaining regular infantry (three divisions and one independent brigade) and this would have affected the forces forward-deployed near the Soviet border (three brigades). The desolate eastern border facing Afghanistan was garrisoned by a single infantry brigade (also to be mechanized). Only one airborne and one Special-Forces brigade were available for rapid reinforcement within Iran, and also for use in the Gulf region.
2. This priority allocation of forces to the Iraqi front was not only consistent with the obvious need to face the Iraqis, but also with long-standing American notions on the containment of the Soviet threat. It was always believed that countries such as Iran could at best delay a Soviet invasion, pending the arrival of large-scale U.S. reinforcements. Accordingly, the decisive battle would be fought on the central Iranian plateau. Iranian forces deployed facing the Iraqi border would readily be available to fight there. It was believed that Iranian forces (and particularly armor) placed well forward near the Soviet frontier itself would only be lost early on, and could also be provocative in peacetime.
3. This plan had a critical defect from the American point of view: by leaving the entire northern rim open to Soviet occupation, the plan made it virtually impossible for Iran to act as an effective counter-weight to Soviet-sponsored Iraqi or Cuban incursions against Kuwait or the other small Gulf states. A threatening Soviet posture on the common

border would obviously ensure the paralysis of Iranian forces including those nominally deployed against Iraq. Soviet coercion would obviously be feasible no matter what pattern of deployment Iran might adopt, but the dual-purpose deployment chosen by Iran provided the Russians with an almost mechanical tool for leverage. This of course, negated much of the U.S. purpose in building Iran into a major military power in its region.

4. Moreover, the Shah's deployment plan was based on two dubious assumptions: first, that Iranian armored forces could actually wage war in the armor-mobile manner against Soviet forces, skilled as the latter are in true armored maneuver, certainly as compared to Iranian forces; second, the plan was predicated on timely and sufficient U.S. reinforcements, and this in spite of the obvious difficulty of airlifting U.S. forces (and particularly heavy units) to Iran.
5. Whatever his wider ambitions may have been, the Shah's theatre strategy was part and parcel of a modified American strategy of containment, whose basic character was set in the 1950s but which was not implemented in the area until the departure of the British from the Gulf, the enunciation of the Nixon Doctrine, and the arrival of much-enhanced oil wealth in the 1970s. Iran was placed into the category of "forward-defense" countries and U.S. security assistance for those countries was (and is) oriented towards delay and reinforcement. The requirements are: (i) to provide forces in place to fight a holding action, in order to gain time for U.S. reinforcements; (ii) to establish essential defense infrastructures which U.S. forces can use; (iii) to protect points of entry, in order to permit the arrival of U.S. forces into the country; and, (iv) to ensure that local forces are operationally compatible with those of the U.S.
6. The deployment and structure of the Shah's forces was thus derived from the American style of war, in which success depends upon the administration of superior firepower upon the enemy. Under the implicit assumption of the 1950s that none could compete with American mobilization capacity, the

task of the forward-defense countries was to provide the time (and the infrastructures) needed to allow U.S. superior forces to be deployed into the theatre.

7. As far as formal policy goes, the Nixon Doctrine and now the greater reach of Soviet projection forces question the premise of this forward-defense concept.* Nevertheless, its residue remains a driving factor. In the case of Iran, almost all analysts would probably have agreed that the individual premises of the assistance formula were invalid but the formula as a whole nevertheless remained the basis of U.S. assistance planning. Specifically, the critical reinforcement premise is obviously invalid: the U.S. no longer has a rapid mobilization capacity of impressive size as compared to the Soviet Union; given the nature of Soviet reserve organization (organically part of the active-duty force structure) it is obvious that the Soviet Union has a much greater reinforcement capability in areas contiguous to it than has the United States.
8. The attrition-by-fire methods of the U.S. Army shaped Iranian deployments as well as U.S. reinforcement plans.** Thus theatre-strategy plans envisaged a "FEBA" running the width of Iran.

* See for instance, Harold Brown, Annual Report FY 1981, Department of Defense, January 1980, pp. 99-100.

** Thus Iran's force-level requirements were evaluated on the basis of firepower indices, (e.g. armored-division equivalents - ADEs). The measurement of relative capabilities and force shortfalls was also accomplished by rule-of-thumb force ratios; finally reinforcement schemes were based on time-scheduling graphs indicating ADEs delivered into the theatre.

II.A.(ii) THE SOVIET THREAT AS THE
CONTROLLING FRAMEWORK

1. No matter who rules the country, Iran faces six distinct threats emanating from the Soviet Union: (i) naval blockade and SLOC attacks; (ii) the Soviet support of local insurgency, in forms advisory, instructional or logistic; (iii) direct military intimidation; (iv) Soviet intimidation in support of Iraqi (or possibly Afghani) invasion; (v) Soviet coup de main operations and, (vi) a conventional invasion, mounted from the USSR itself.
2. With the exception of certain minor elements, all non-Soviet external threats were assumed to amount to lesser included cases. Thus in spite of Iran's complex relations all around, the Soviet threat in fact defined the requirements of Iran's defense structure.
3. The Shah's alliance connection with the U.S. could have alleviated (and even neutralized) some of Iran's military vulnerabilities. Notably, the alliance made it unnecessary for Iran to develop naval forces capable of coping with Soviet interference with Iranian seagoing commerce. Instead of trying to cope with this threat directly (as it did) Iran actually needed only to circumvent a Soviet naval blockade by transferring the burden of securing maritime access to the major Western powers - a task which the latter could not avoid, given their dependence on Persian Gulf oil.
4. The Alliance could also have been valuable in another sector of high-cost technology-air defense, where the main purpose (other than the assertion of sovereignty over the air space) could have been limited to the containment of Soviet military intimidation by overflights etc. and to limit terror bombing. The Soviet Union could not have exercised the upper range of intimidation (the threat of nuclear attack) for fear of the U.S. and world-wide reaction, and long-run effects upon nuclear proliferation. Nor could the Soviets have exercised the option of (non-nuclear) strategic bombing against Iranian cities without risking similar reactions.

5. The Shah's connection with the U.S. should have been most useful to Iran in dealing with threats that required a high-technology military response. In regard to the other threats, however, it was much less useful. For example, the best long-term insurance against-threat (ii) (direct Soviet support of insurgency) could only come from a diplomatic balance, and from the Soviet interest in such economic links as the sale of Iranian gas and oil to the USSR. It is obvious that as far as Iran's vulnerability to Soviet intimidation is concerned, the Alliance was a most important countermeasure.
6. In the case of Iran, threats (iii) and (iv) derive from threats (v) and (vi) that is, coup de main and invasion. If Iran could design a realistic military response to a surprise attack (and also to a more deliberate invasion) Soviet intimidation would lose much of its credibility.
7. The former USG threat assessments of Soviet invasion capabilities against Iran were dubious in two respects: in the estimate of the specific divisions that would be involved, and in the tempo of likely Soviet operations. It was conventionally assumed that the Soviet Union would rely on the twenty-four divisions assigned in peacetime to the North Caucasus, Trans-Caucasus, and Turkestan Military Districts;* all of these are Category II and Category III formations. This assumption was rationalized on the grounds that the Soviet Union would be unwilling to risk thinning its forces elsewhere in order to act against Iran. However this contention is open to doubt:
 - (i) Except for NATO, there are no military forces anywhere capable of mounting serious incursions into Soviet-controlled territory.
 - (ii) The Soviet Union has a reserve of seventy divisions in central and European Russia. Any Iranian levy of assault divisions from this reserve could most likely

* The Military Balance 1979 - 1980, IISS, p. 10.

be returned to the "pool" before it would be needed elsewhere, in the event of a wider conflict.*

- (iii) Soviet doctrine in fact virtually rules out the use of Category III divisions to spearhead attacks; the Soviet army is unlikely to lead attacks-even with Category II divisions. USG threat assessments assumed that reservists could have been so used because they would have been called up and divisions made ready for battle before the outbreak of war. But this use of second-line divisions is contrary to the historical experience in Europe - and in this connection it must be noted that the Soviet doctrinal and mobilization systems have a distinctly "German" flavor. Unless Soviet planners have utter contempt for Iranian military capabilities (a potential Iranian asset, if true), the Soviet army is therefore unlikely to spearhead the ground attack with the Category II or Category III divisions assigned to the three contiguous military districts.

8. It follows directly that any Iranian theatre strategy based on force ratios, the contest of material resources, firepower, and Lanchesterian-type attrition models was doomed to failure. Soviet reinforcement capabilities are simply too overwhelming even with full USG cooperation in Iran's defense. It is true that the ground transport net leading to the Iranian plateau from the USSR is constraining and is also potentially vulnerable; but U.S. lines of communication onto the Iranian plateau are even more constrained, having to run through the Zagros Mountains, after the Gulf SLOC and the oceanic SLOCs. Further, it cannot be assumed that any third parties - other than possibly NATO - could mount any relieving pressure against the USSR on behalf of Iran's defense. Only NATO has an offensive potential against the Soviet Union, and the political preconditions of the activation of this potential are most demanding.

* It is assumed here that Category I divisions from the pool would be used only for the initial (assault) phase of operations in Iran; Categories II - III reserve divisions would then be used for consolidation and control.

9. It follows also that operational surprise should be assumed. The method of war-initiation that the Russians have adapted from the German "Barbarossa" model (demonstrated in Manchuria in 1945) does not require true "strategic" surprise.* All that is necessary is that a sufficient uncertainty of intentions be maintained to inhibit the victim from taking necessary precautions, for fear of provoking the outbreak of warfare. Soviet planners can therefore afford the disclosure risk of ambiguous signals emanating from the deployment of first-class (Cat. I) divisions to the frontal zones. Tactical air regroupments on the other hand, can be readily masked by prior "bare-basing", executed over a prolonged period. The critical factor is the ability to mount a high tempo offensive once hostilities begin. This calls for tactical and operational surprise as to the location and manner of attack, and of course it requires absolutely the commitment of high-caliber forces at the cutting edge. But these units need not be large in relation to the whole force. The remaining mass could consist of Cat. II/III follow-up forces whose task would be only to consolidate the gains of the first-line units.**
10. Thus the USG downgrading of Soviet capabilities against Iran on the basis of the low quality of the divisions in the contiguous Military Districts, (e.g. their non-Russian composition) amounts to a misunderstanding of the nature of Soviet warfighting and mobilization methods.
11. It is of course possible that the Russians might choose to deviate from their preferred model. But why should they want to do so? After all, the use of the units already available in the contiguous MDs would not gain for them "strategic" surprise except in special circumstances, since certain support forces (in particular air assault and engineer units)

* True "strategic" surprise is a rare phenomenon in military history. The Soviets were well aware of German preparations in Spring 1941, as were the Japanese of the Russian in the summer of 1945. For a discussion of the broader implications of the Manchurian model, see J. Despres et al., Timely Lessons of History: The Manchurian Model for Soviet Strategy, RAND, July 1976.

** It appears that this was the mode of the recent Afghan invasion. High caliber airborne divisions were flown in from European Russia for the coup itself, while the mass of mobilized Military Region forces have been given low-combat tasks of holding cities and main roads.

would still have to be deployed forward before the outbreak of hostilities. As for any attempt to fill up and shake down Category II and III divisions for the purpose of leading an attack, this would imply considerable loss of time while such divisions would still not offer a guarantee of high quality, even after extensive refresher and unit training. From the Russian viewpoint, such an uncertainty is probably unacceptable. For Soviet prestige and influence it would be essential to ensure that any offensive against Iran be swiftly overwhelming. Consequently there would be no justification for foregoing the use of high-caliber units unless a wider conflict were imminent.

12. But in that case, the Russians would in any case be extremely reluctant to dissipate their strength in a secondary theatre.* Iranian and Gulf oil is of course critical for the West's economic well-being and political stability, but it is not a critical constraint upon the West's ability to wage war. In any case, the effects of oil denial would be much too slow given Soviet time-schedules for a decisive victory against NATO.
13. Thus for both political and operational reasons, Soviet planners would feel compelled to deploy high-quality forces against Iran or else forego the operation. Their aim must be to achieve a rapid, low-casualty, fait accompli. A protracted conflict, with its concomitant requirement for sustainability and large-scale supply flows, would only develop if the planned operations failed, an event obviously to be guarded against by adding even more force before the fact. The Soviet General Staff would still expect to win a protracted conflict against Iran (plus any allies, including the U.S.) but it is obvious that this would be a costly outcome to be avoided if at all possible by the use of maximal force from the start.

* It may be argued that the Soviet Union might attack Iran precisely to divert Western forces from Europe, in particular U.S. reinforcements to NATO. However U.S. airlift could be diverted by any number of scenarios without the corresponding diversion of Soviet resources.

14. In the threat assessments formerly made by U.S. military authorities, it was the normal practice to "bound" the threat by delimiting the size, quality and logistics of the opposing (Soviet) force deemed to be assigned to the theatre. "Force-bounding" has a special appeal in contingency analysis since it provides ready criteria for countervailing requirements. In the case of Iran, however, the threat is much too open-ended for this procedure to be valid. This suggests that either the task of defending is impossible without the use of nuclear weapons or else that the method chosen to deal with the threat must be qualitatively different from the conventional approach.
15. To be sure, the capacity of the road net (+ airlift) could be the limiting factor, but not in the manner normally envisaged. It is true that in a Soviet crossing through the northern mountains, forward units would require much logistical support (in particular engineering help but also fuel and replacement parts). But once the forces get through the mountains, it would be a mistake to "bound" the threat by the tonnage capacity of the transport network. Historically this has not been a fruitful endeavor. Eighty percent of the tonnage needed is for only two items: fuel and ammunition (mainly for the artillery) and both needs are in fact controllable. Soviet armored forces would fight in spurts, and in their advance (or defense), stratagems can substitute for much artillery fire.

II.A.(iii) THE FORMER THEATRE STRATEGY AND ITS OPTIONS

1. For all practical purposes, U.S.-Iranian defense planning ignored the threat of a coup de main on a strategic scale. What follows thus applied only to the threat of a conventional invasion.*
2. Iran cannot possibly expect to match a Soviet invasion army in terms of numbers, technology, or troop quality. On the other hand, Iran does have certain geographical advantages, and could in the past rely on American support to some extent. As a spacious and semi-arid land of mountains, Iran does have the opportunity to build a defense that would block spearheads, complicate armor envelopments and overstretch Soviet logistics. From its U.S. ally, Iran could expect both air and naval support, but the size, promptness and real utility of American ground reinforcements was uncertain. For example, concurrent Soviet threat-maneuvers in Europe could have precluded American assistance to Iran, certainly limiting the availability of both combat forces and also air/sea lift.
3. U.S.-Iranian defense planning had, in theory, four broad options against a Soviet invasion:
 - (i) Delay, and await U.S. reinforcement on the Iranian Plateau.
 - (ii) Delay and withdrawal to the Zagros Mountains.
 - (iii) A protracted territorial defense (= "People's War").
 - (iv) A protracted defense of the northern mountain barrier.

In practice, (iii) was ruled out on political grounds, and (iv) was ruled out on operational grounds even though it was the option most consistent with good military practice. This left only the first two options, and both were in fact pursued in U.S.-Iranian defense planning.

* The coup de main threat is discussed in some detail in II.B.(iv) below.

(a) The "Delay and Await U.S. Reinforcement" Scheme

1. Under this option, the defense concept implied a straight resource-matching contest with the Soviet Union. While little would be done to extract advantage from Iran's specific geographical features, the defense was to match Soviet capabilities in kind. This approach called for the building of a large Iranian army (and air force) whose firepower was to compete with Soviet capabilities (measured in firepower terms). U.S. planning would then measure the Iranian deficit in terms of armored-division equivalents (ADEs), and this deficit would have to be made good from the continental U.S. in the event of war. It is obvious that such an option maximized the possible burden upon the United States: since Iranian forces cannot possibly match the general technological sophistication of Soviet forces, nor their troop quality, the U.S. would in fact have been required to make up the qualitative deficit, as well as the quantitative deficit, the only one that was recognized.
2. This option did have a major political virtue: it clearly expressed the U.S. commitment to Iran and to some extent this might have enhanced deterrence. But there was danger in the military irrationality of the concept: since it could have lead to a humiliating defeat, it might have encouraged a Soviet attack, in order to expose American weakness.
3. It appears now that this option reflected a basic misunderstanding of the nature of warfare in the Soviet style. It assumed that war outcomes could be measured by relative firepower scores, and that the defense would have some fixed ratio in its favor. But in fact, in both armored and mountain warfare the offense actually has the advantage against a defender which relies on the putative advantages of the defense. The defense certainly does not have an advantage of 3:1 in the mountains and 1.5:1 on the plateau as was postulated in some studies of Iran's defense. To be sure, an attacker moving against a well-entrenched defensive position is generally at a severe disadvantage; hence the well known 3:1 rule of thumb.* But this is only true for frontal attacks against

* For which there is no empirical basis whatever.

alerted defenders. The essence of tactics and of the operational art of warfare is to subvert the defender's potential advantage, by two general means: stratagems and outflanking. The first depend upon deception and (then) surprise; the second upon opportune maneuver. Both are of the essence in mountain as in armored warfare.

4. The predicament of a defense which relies upon the firepower of fixed positions is typified by the dilemma it faces in countering outflanking moves. If it relies on well-defended (but isolated) outposts, these will be vulnerable to turning movements across their own line of retreat;* and the attacker need not attack them at all. Thus, to impose a disadvantageous frontal attack upon the enemy, the defender must extend his own line to catch any outflanking move, but in doing so, even a numerically superior defense can easily become overextended. This in turn then allows a competent attacker to develop stratagems to penetrate and separate the defender's extended line, which can be defeated in detail at a later stage. Accordingly there is no sound tactical basis for plans and reinforcement programs based on fixed defense/offense ratios and relative firepower scores.
5. It should also be noted that the specifics of the situation also stood against this option. The "delay" phase, and the defense of the central plateau would have required two very different force-structures. Before the Shah's overthrow, Iran had four armored divisions and was in the process of mechanizing the four infantry divisions; this would have left only two non-armored brigades in the army. And yet to make this option workable, the Iranians would have had to delay significantly a Soviet advance across the mountains, in order to gain time for the U.S. reinforcements. Such combat would obviously have required light unmechanized infantry. But then the Iranians would have had to fight on the plateau and this would have required armor and not infantry, let alone of the light variety. In fact the Iranians were making no provision for the first phase, and would have been incapable of the second.

* The poor showing of the numerically superior Indians against the Chinese in the 1962 Himalayan War can be explained by this phenomenon. The Indians nominally held the advantage of entrenched positions, but their overall defense was based on static positions while the Chinese operation was fluid.

6. Since it was assumed a priori that unassisted Iranian forces could not cope with the Soviet Union, the Shah placed very few of his troops near the Soviet border. Only small forces were readily available for forward-defense and delay operations. It may be argued that the Shah could always have brought in forces from elsewhere to execute delay operations against the Soviet Army. But given the overall structure, this was not in fact possible. Any attempt to use armor well forward would have led to the early loss of the expensive armored/mechanized forces, and possibly also to the rapid disintegration of the entire army from induced panic. Armored units cannot be used to defend or delay in mountains; they can only be deployed behind mountains, to seal the exits. On ridges and in mountain valleys their positions can be readily turned; and once cut off, armor cannot be extricated. Since armored troops are psychologically unprepared for non-armored combat, the result is inevitably defeat-in-detail if not infectious panic.
7. If the Iranians could have mounted the required delay operations (by acquiring light infantry, with a correspondingly reduced emphasis on mechanization), the outcome would then have depended on their ability to use tanks in combined-arms teams for combat in the plateau. It is questionable whether the Iranian army had this capability. Very few armies do; many armies have tanks but few have the ability to coordinate tolerably well the different branches of the combined-arms team. Even fewer have the mindset, tactics, and communications needed to use an operational doctrine of armor in fluid maneuver, as opposed to semi-static set-piece movements. These technical and operational capabilities would have been very difficult to acquire for the Shah's army. Aside from cultural factors, it was the Shah's practice to compartmentalize the branches of his armed forces, and to centralize control in his own hands. This, of course, reduced the chance of a military coup d'etat, but it also militated against the joint training and coordination needed for true armored warfare.
8. It is therefore a fair assumption that Iranian armored forces would have been no match for Soviet armor once the latter reached the plateau.

Iranian forces would probably have been deployed piecemeal, in separated blocking positions; consequently, they would have been quickly outflanked and defeated even by quantitatively inferior Soviet armored forces. Until enough American ADEs would have arrived to form a significant share of the total allied force, any American units in the field would also have been jeopardized by the defeat of Iranian units on their flanks.

9. Moreover, the conduct of a large-scale armored defense on the Iranian plateau would have been dependent upon Iraqi benevolence. Whether fluid or FEBA-like, a defense of the Iranian 'waist' would uncover the Iraqi border. This in turn would have created the possibility of Soviet passage through Iraq directly to the Gulf; the only rail LOC and the main road LOC to the plateau would thereby have been threatened.
10. It may be concluded therefore that the "Delay and Await U.S. Reinforcement" option was not in fact militarily feasible. From the Iranian viewpoint, the American commitment was too uncertain, if only because of the NATO contingency on the actual flow of reinforcements. For the U.S., on the other hand, the option was one of extreme risk. There was very little likelihood that the defense could have held long enough for significant U.S. reinforcements to arrive. In the interim, U.S. units in place would have been in great danger. If the local situation did stabilize because of U.S. reinforcements, the United States would then have been saddled with a protracted conflict in circumstances apt to favor Soviet rather than American persistence.

(b) The Zagros Perimeter Scheme

1. A perimeter defense based on the Zagros mountains was a fall-back option built into the "Delay and Wait" scheme. Its virtues were the shortened lines of communication to the Gulf, the defensive suitability of the mountainous terrain, and the fact that the resulting enclave would enclose the primary U.S. interest in Iran, the oil fields.
2. It is evident that this option would have meant the abandonment of Iran as a nation. Politically, this meant in turn that the Iranians would in fact be out of the conflict, with the war becoming a purely Soviet-American confrontation. The activation of Iraq and a Soviet military incursion to the Straits of Hormuz would have been likely events in such circumstances. A Soviet-Iranian confrontation, even if played out with significant American support would remain quite different from a direct Soviet-U.S. conflict. But the abandonment of Iran and the shift in the regional balance of power implied by an enclave strategy would most likely have removed any Iraqi inhibitions about the passage of Soviet forces through their country to reach the Gulf - and thus the land LOCs running from the Khuzestan lowlands to the Zagros range. A Soviet seizure of the Iranian naval and air base at Bandar 'Abbas on the Straits of Hormuz might also have been difficult to prevent, cutting the sea LOC. It would also obviously have an extremely destabilizing effect on the brittle traditional Arab regimes of the Gulf.
3. The Zagros strategy would definitely have been militarily sound in a narrow tactical sense, because of the shorter and more defensible front-lines, the shorter LOCs, and the added time gained for U.S. reinforcements. But on the other hand, a retreat to the Zagros would probably have destroyed the will to fight of the remaining Iranian components of the Allied force, thus offsetting in part the arithmetic advantages of the scheme.

4. The main attraction of an enclave strategy is the reduced requirement for front-line combat forces obtained by shortening the front. In the case of Iran, the Zagros enclave scheme was attractive for American decision-makers because of the apparent reduction in the number of American troops needed to make up the ADE deficit. This followed directly from the methodology used to size the force: (i) it was asserted that the defense obtains a 3:1 advantage in mountainous terrain, (versus 1.5:1 in open country). Since the Iranian Army provides the greater share of the total force, a withdrawal to the Zagros line would reduce more than proportionally the firepower deficit that would have to be made up from U.S. resources. What this reasoning obtained from using a "length-of-line" methodology. What this reasoning ignored is that in the process of withdrawing to the Zagros line, some portion of the Iranian force-structure would be lost. If this portion were large, be it from a collapse of will or from Soviet action directly, the advantage of better defensive positions would have been offset by the reduction in the Iranian component of the total force.
5. But the more fundamental defect of the strategy was in fact tactical: in mountainous terrain, as shown below,* it is the attacker and not the defender that usually holds the advantage in terms of force ratios. Thus the (tactical) premise of a 3:1 advantage in favor of the defense (used in sizing the total forces required and the shortfall to be made up from U.S. resources) was itself unjustified. The total force requirement may be actually have been larger in the Zagros than on the plateau. This plus the loss of Iranian forces which is to be expected would actually have increased the shortfall of ADEs (and thus the U.S. reinforcement requirement).
6. The implicit assumption that the Zagros scheme offered a fallback option given a prior defense on the plateau is also questionable. A defense on the plateau unambiguously requires an armored force, and such a structure is obviously not suitable for operations in mountains. A fallback to the Zagros would thus have ensured a mismatch between the force-structure

* See II.B.(iii) below.

and the terrain. For this reason also it must therefore be concluded that the Zagros enclave defense did not offer a real fallback option for a defense of the plateau.

7. Successful operations in mountains depend upon agility. It is obvious that armored and mechanized divisions are much too heavy for the task; it is not so widely recognized that normal infantry divisions in the heavy U.S.-style are also unsuitable. Their tactics rely too greatly on sheer firepower and static entrenchments. It will be argued below that a defense of mountains must be based on light infantry, sappers, and pre-stocked caches for some logistical autonomy. The point of relevance here is that if a special mountain-infantry force-structure is deployed, it might as well be applied in the northern frontier mountains to begin with rather than in the Zagros.

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II.B. A RELATIONAL-MANEUVER ALTERNATIVE STRATEGY FOR IRAN

Overview

1. The relational theatre strategy here advocated amounts to a light-infantry defense of the northern mountains that form a major barrier along 1,000 linear kilometers of the Soviet-Iranian border.
2. Operationally, this defense would seek to exploit the rigidities of Soviet-style armor-mechanized forces in the mountain terrain. It is argued in detail below that while a positional mountain defense is bound to be very weak (even if single positions were formidable) an agile defense could be very strong, if it is indeed agile enough to circumvent the inevitable outflanking attempts.
3. Such a theatre strategy would call for an army of light-infantry battalions (viz armored divisions) with a rather small armored adjunct. The latter would be needed mainly to seal the exits of the (ten) invasion routes that cut across the mountains rather than to engage in armor-mobile operations.
4. Since the theatre strategy would rely on dispersed low-contrast infantry which needs only minimal supply support, Iran would not need high-quality, area-wide, air defenses, the infantry being inherently resilient to air attack from high performance aircraft in the ample cover of mountain terrain. On the other hand, anti-helicopter hand-held SAMs would be crucial.
5. Iran would still need a thin area-wide air defense, to inhibit terror bombing, and to cope with non-Soviet threats. Such needs could be met by an air force of lightweight fighters along with a modest number of interceptors with F-4 type radar capabilities.
6. As far as Iranian navy is concerned, it is argued that in view of the need of other nations to secure the Gulf SLOCs anyway, Iran should limit itself to intra-Gulf naval forces (missile boats, patrol craft). Such a navy could still easily be distinctly superior to all other Gulf navies.

II.B.(i) IRAN'S SECURITY: THE DISTINCT THREATS AND
THE RANGE OF SOLUTIONS

1. Any stable and coherent Iranian government must confront a number of diverse security problems: (i) the maintenance of military loyalty, of internal security country-wide, of central control over regionalist tendencies and ethnic separatism; (ii) the preservation of the country's territorial integrity vis a' vis its (lesser) neighbors including (coastal) maritime protection and airspace control; and, (iii) any Iranian government striving for independence must have some sort of defense against Soviet intimidation and coups de main, if not outright invasion.

The Shah's answer to all these problems was textbook American: the deployment of armored and mechanized divisions, of an air force more sophisticated than any in Europe, and of a pocket oceanic navy. As a result, the Shah's military structure was not well designed to cope with either his military or his most pressing need of internal security; and no attempt was made to exploit the special features of the Iranian context, e.g. the mountain terrain in Northern Iran. Nor was this U.S.-style structure at all well-suited to the manpower available to Iran.

2. A small power such as Iran cannot possibly fight the Soviet Union on Soviet terms. Instead, it must learn the peculiarities of the stronger opponent, identify weaknesses, and then learn to take advantage of them. Such a "relational" approach results in strategy and tactics which are shaped by the doctrine and character of the main enemy, the quality of his leadership and high command, the tactical skill of field commanders and soldiers, by the enemy's rigidities and flexibilities, by his capacity to react under pressure, and so on. The aim then is to apply specialized or localized strengths (e.g. a terrain advantage) against the identified weaknesses of the enemy, in order to prevail by avoiding the direct clash of symmetrical capabilities. Iran violated these relational guidelines. The Shah could have learned much from the Israeli experience:

Israel has realized that it cannot adopt foreign doctrines of the bigger powers which are incompatible with its material capabilities, political situation, and cultural milieu. It had to find its own solutions for its (own) problems. The reserve system, the weapons-acquisition and procurement processes, the logistical structure, and all other elements....had to be tailored to Israeli needs, and on occasion, had to be developed from scratch.*

3. The obvious reluctance of Iran's new rulers (and indeed inability, given the requirement for outside supervisory assistance) to maintain the Shah's high-cost establishment has a silver lining for Iran, and also for the Western interest in the security of that country: Iran can now reassess its security requirements ab initio. A new military design for Iran's defense should cut across the full spectrum of its security concerns; and it should definitely be "relational" in order to reduce costs, and also to achieve some degree of security vis a' vis the Soviet superpower. These criteria immediately rule out any high-technology solutions. On the one hand, such solutions are too destructive and require too much non-combatant support to be well-suited for internal security tasks and especially the control of regionalist dissidence. On the other hand, against the Soviet Union, a technologically-oriented Iranian military structure would be quickly worn down, even if not outclassed by the across-the-board qualitative superiority** of Soviet military power.
4. By contrast a structure based on light infantry forces - in particular mountain infantry - complemented by helicopters as well as some tank and armored-reconnaissance brigades, with a small air-defense oriented air force, and a small-boat coastal navy, could satisfy all the military

* Michael Handel, Israeli Political-Military Doctrine, Occasional Papers in International Affairs, Number 30, Harvard University, July 1973, p. ii.

** The Shah's forces were acquiring many highly visible items of sophisticated weaponry, but specific items do not equate to across-the-board sophistication in firepower, control, electronic warfare, etc. It is to be particularly noted that some of Iran's sophisticated weaponry would have been quite ineffective against Soviet forces without the on-the-spot reprogramming help of American EW specialists.

needs in a relational manner - except as far as an outright Soviet invasion is concerned. It is obvious that such a structure would also greatly diminish the "back-end" problem of absorbing equipment into the military structure, and also the side-effects on the civil economy (notably by requiring fewer technicians). It is also obvious that such a military structure would be well suited for the tasks of internal control. Even vis a' vis the Soviet Union such an approach would give to Iran some capability to protect itself from aggression without any immediate need for outside assistance.

II.B.(ii) A RELATIONAL DEFENSE STRUCTURE FOR IRAN

1. It is clear that all of Iran's military concerns other than the Soviet threats can best be satisfied by an infantry-oriented force structure. The question addressed in this section is whether such a structure could also be of use against a Soviet attack. This could take the form of a whirlwind coup de main and/or that of a deliberate invasion in strength. If Iran could design a defense capable of resisting a surprise attack, if not a more deliberate invasion, northern Iran would no longer be hostage to the Soviet Union, Soviet intimidation would have much less credibility, and Iran could therefore play a more meaningful role in the regional balance. It also follows that if Iran could effectively defend in the mountains against the Soviet Union, a similar capability would exist against all lesser opponents, even if they - unlike the Soviet army - were appropriately structured for mountain warfare. Nor would Iran thereby lose the capability to attack into the Iraqi flatlands with armor.
2. In designing a defense against attack by the Soviet Union, Iran cannot possibly hope to match such an enemy in terms of numbers, technology, or troop quality. Any Iranian solution predicated on a contest of material resources, any firepower approach based on Lanchesterian-type attrition models must be doomed to failure. Soviet reinforcement capabilities are simply too overwhelming. It is true of course that the ground transport net leading to the Iranian plateau from the USSR is definitely constraining, and it is also potentially vulnerable; but the lines of communication onto the Iranian plateau that any Iranian ally would have to use are even more constrained. In any direct clash of armor and firepower, the Soviet Union is bound to prevail. Only a relational defense, designed very specifically to exploit both terrain advantages and the particular shortcomings of the Soviet force-structure can offer hope for success. For example, Soviet armor-mechanized forces are plainly unsuited for combat in high-mountain terrain, while Iranian forces could be especially designed for that purpose.

4. To be sure, mountain terrain will not favor a positional defense against a more fluid offense;* but mountain barriers do allow scope for a combined defense featuring light-infantry blocking and counter-stroke tactics, complemented by (a) positional elements, and (b) by armor in the rear, to cover exit routes from the mountains. While the Shah's planned all-armored force-structure could not have implemented a relational defense (and was not meant to do so), the latter remains a feasible (and much cheaper) alternative, which calls for a force-structure largely made up of mountain-oriented infantry.
5. A defense of Iran vis a' vis the Soviet Union cannot be based on armored forces. Iran's armored forces cannot possibly match the generalized technological sophistication of the Soviet Union, nor their troop quality. On the other hand, Iranian armor could be used to good effect to attack into the Iraqi flatlands. For that purpose, however, Iran would not require a homogeneous armor/mechanized army. As the Germans did in World War II and the Soviets still do today, only the spearhead forces need be of high quality. The remainder can consist of simpler motorized infantry for consolidating the gains of the tank spearhead. By contrast, Iranian armor could not be used defensively against Iraqi infantry forces invading into the Iranian mountains: in mountain terrain, no defense or even delay can be mounted by armored forces. Such forces are too easily flanked, and their line of retreat and sustenance are too vulnerable to enemy infantry, moving on foot or by helicopter.
6. Thus for tactical, operational, and strategic reasons, a defense based on (expensive) armored forces is inappropriate for Iran. In particular,

* The essence of tactics, and of the operational art of warfare, is to subvert the defender's potential advantage of position by two general means: stratagems and outflanking. The first depend upon deception and (then) surprise, the second upon opportune maneuver. The problem of a defender relying upon the firepower of fixed positions is typified by the dilemma he faces in countering outflanking moves. If he relies on well-defended but isolated outposts, these will be vulnerable to turning movements across their line of retreat; and the attacker need not attack them at all. To impose a disadvantageous frontal attack upon the enemy, the defender must therefore extend his lines; but in doing so, even a much more numerous defense force can then become overextended. This allows a competent attacker to develop stratagems to penetrate and separate the defender's extended line, which can then be defeated in detail.

a defense based on tank forces could not be viable against the Soviet Union and would leave northern Iran hostage; and the ensuing weakness would vitiate the Iranian role in the regional power balance. Outside alliances cannot materially offset this deficiency. As for Iran's other military concerns, an armor-based force-structure is too restrictive: armored forces cannot be moved about readily, and they lack the infantry content necessary for internal security tasks, for the suppression of separatism, for the defense of the rough and thinly populated eastern border, or for intervention in the Gulf states. In the Shah's force-structure, only one airborne and one Special-Forces brigade were available for rapid reinforcement within Iran, and also for use in the Gulf states. Thus, aside from the demonstration effect of his impressive air and naval forces, the Shah only had a small capability to intervene in areas not contiguous to his own borders.

7. By a similar line of reasoning it can be argued that Iran has no real need for sophisticated naval and air forces. Iran's importance as an oil exporter eliminates any need for an expensive "blue-water" fleet (since those that need its oil will themselves have to ensure access). A shift from the Shah's armored structure to a defense based on agile mountain infantry would eliminate much of the need for battlefield air defenses, and most of the need for ground-support capabilities. To obtaining demonstration effects, it is not necessary to modernize the whole force: a small high-technology segment will suffice in a "high-low" mix.
8. In addition to providing a defense against invasion in the conventional manner, Iran (as other countries directly threatened by the Soviet Union) must also prepare to resist a Soviet coup de main operation. Among other things, this calls for some armored cavalry units for deployment in the deep interior - near the nerve-centers that would be the primary targets of Soviet air-landed operations. In what follows, it is argued that a "relational" defense strategy for Iran would have to be based on the barrier on the northern mountains; no effective defense can be achieved by armored combat in the plateau, nor by an enclave strategy focused on the Zagros mountains. As for a territorial ("people's war") defense, that is not a realistic proposition given the separatist tendencies of Iran's Turks, Kurds, Baluchis and Arabs (50% \pm of the population).

II.B.(iii) A RELATIONAL THEATRE STRATEGY: A FORWARD
DEFENSE IN THE NORTHERN MOUNTAINS

1. Of Mountain Warfare in General: it is widely believed that as between defense and offense, the defense is the stronger of the two. It would therefore follow that if the barrier strength of mountains is added, a mountain defense must become stronger still. This conclusion is often confirmed by eclectic examples drawn from history, such as the German success in containing the allies on the Italian Front in WWII. In point of fact, however, while the defense generally has had the advantage in open terrain, the reverse is true in a mountain defense. The Italian campaign was atypical for several reasons: the German command and notably Field Marshall Kesselring, was exceptionally gifted; the Allied command for its part, was cautious and schematic.* But most important - the Germans practiced fluid tactics behind screening entrenchments rather than positional warfare, and most armies are quite incapable of fluid tactics in the compartmentalized terrain typical of mountain environments.
2. To balance the misleading WWII Italian example, many counter-examples could be listed but two will suffice: (i) the failure of the Anglo-Greek defense against the German invasion of Greece in 1941, where strong tactical defenses based on mountain barriers were repeatedly turned by German infantry;** (ii) the collapse of the Italian Alpine defense in

* For a polite but lucid critique of Allied performance, see Field Marshall Kesselring and General of Cavalry Westphal, Questions Regarding the German Strategy During the Italian Campaign, U.S. Army Historical Series, MS #B-270, undated.

** Notably at Thermopylai, the Pass of the Hot Springs, where the roadway narrows at the base of the high cliffs of the Kallidromon, the Anglo-Greek force held out for two days (April 24 and 25, 1941), effectively stopping the advance of German armor but their position was turned by dismounted German motorcycle troops. Leonidas and his men had also resisted for two days in August 480 B.C. until the Persian "Immortals" turned their position by climbing the mountain.

October/November 1917, when the arrival of six high-grade German divisions inaugurated serious combat in that theatre.*

3. As Clausewitz pointed out, the forces of the defense may be split in mountains, because each tactical position is so naturally strong that it can be safely held by a handful of men. But by the same token the forces of the defense (if its method is positional) must be split because each little force assigned to an inaccessible peak becomes the prisoner of its own formidable position. Each little force may then easily defend in place but it cannot serve to deny outflanking movements to the enemy. As the forces of the defense split up more and more to secure each and every passage whereby it may otherwise be turned, the defensive deployment as a whole eventually becomes a "cordon", i.e. a thinly-stretched linear defense which can easily be pierced by an enemy still free to concentrate his own forces against chosen points of penetration.
4. It may still be true that a "handful of men" can hold against a complete regiment in a mountain position of great natural strength, but all that will be available to the defense in each place will be precisely a "handful of men", while the offense may have several "regiments".
5. This conclusion, however, applies only to a positional mountain defense. It does not apply to a fluid and agile mountain defense that faces a road-bound or otherwise rigid mechanized offense, whose infantry is trained to support armor, and is in short supply.

* Of this defeat, Clausewitz was obviously well-informed:
"The higher and less accessible the mountains, the more the forces may be split: indeed, the more they must be split, because the smaller the area that can be secured by combinations based on movement, the more its security must be taken care of by direct coverage. Defense in the Alps requires far greater subdivision, and comes much closer to the cordon method, than defense in the Vosges..."** (Emphasis in the original)

** P. 432 in Howard/Paret.

6. The key to victory in defensive mountain warfare is the same as in armored maneuver: the use of echeloned reserves and fluidity to obtain an advantage in the relative tempo of action.* It follows that a mountain defense for Iran cannot possibly be based on a combination of armored formations and infantry in static entrenchments. Armored formations can have no role within the mountains itself. A light-armor cavalry screen and even some armor may be needed forward of the Northern Mountain barrier for peacetime presence functions. But these forces would almost certainly be unable to extricate themselves through the barrier in the event of a Soviet offensive and would add little to the defense of the barrier itself. The more important role of armor would be to close the exits from the barrier to the central plateau.
7. By contrast, a fluid and agile infantry defense of the mountain barrier could be highly effective. Positional elements would still be needed, and indeed some fortified positions would be indispensable to anchor of the defense (especially to prevent the surprise seizures of key points of the road net). What must be avoided however is the notion that positional defenses in themselves can provide a meaningful defense. Even major fortifications can only check temporarily an attacker's advance. The only solid defense is a mobile reserve which can rapidly counter the attacker's flanking movements, and attack his rear echelons. But this is difficult to achieve in the compartmentalized terrain typical of mountains, though helicopter transport nowadays offers help. On the other hand, if the defense is seduced into adopting a cordon deployment by the apparent strength of positions it will lack the wherewithal to form sufficient reserves, while the troops will also become sedentary and much too dependent upon roads.
8. Strong positions should be viewed as no more than pivot points and fire bases for the maneuver of fluid, tactically-offensive, forces; and the

* In fact Clausewitz's line of argument contains the seminal outline of German Blitzkrieg theory. Clausewitz recognized that in open terrain the defense has the emplacement advantage of static blocking positions and, more important, it has the advantage of the second move against an attacker's flanking attempts. In mountain warfare, the defender does have a greater static-position advantage but the compartmentalization of terrain forecloses the more important second-move advantage. The attacker can therefore "turn" even strong positions, cut off their line of sustenance and retreat, and thus induce a general collapse unless the defense is distinctly more agile.

troops holding such positions must be ready for eventual exfiltration, accepting the abandonment of whatever heavy weapons are used in the fortified position themselves. Only the lighter weapons can safely be saved in each move; inappropriate attempts to bring back more than that may lead to the loss of the garrisons. In today's world, the mortars and light cannon which should be the mainstay of positional defenses are relatively cheap. For the price of a single high-performance aircraft, one can buy hundreds of light cannon and mortars. Such weapons should be viewed as expendable and their replacements can be pre-stored in successive fall-back positions. But garrisons cannot be sacrificed so easily, if only because of the effect on the morale of the remaining troops.

9. In mountain warfare, flanking counter-attacks do not obtain their effect only from size or firepower. Surprise itself can disorganize and demoralize. The agile elements of the defense can be trained to materialize out of the mountains to launch their hit-and-run attacks. What would protect them, and also magnify the morale impact, is deception, surprise and elusiveness. Against enemy infantry attempting to outflank pivot positions, their task would be to turn the enemy's own flank. This can serve to lengthen the life of the defensive position, but the major aim is to reach the attacker's own deep flanks - where the enemy's soft supporting forces are to be found. In mountain warfare, particularly against an opponent attempting to push armored columns through narrow approaches, successful attacks against the supply units in the rear can quickly lead to the demise of the (heavy) main forces.
10. To achieve deception and surprise in mountain warfare, the agile elements of the defense require logistic autonomy. Only thus can they "spring" from the mountains, to acquire an aura of destructive evanescence. To the Western military mind, used to the heavy tonnage requirements of frontline troops, it seems that no such autonomy can possibly be achieved. Mountain infantry however is inherently adaptable to logistic stringency since such light foot forces require no mechanization, with its attendant demands on fuel, spare-parts, and maintenance, while stealth and the exploitation of terrain substitute for heavy firepower support. Thus

their logistic requirements are limited to small-arms ammunition, grenades and demolitions, and a limited amount of mortar support as well as food. These are all cheap, long-life, small-tonnage items, which could be cached in peacetime. This would allow mountain troops to move about freely, and reduce enemy efforts to mere shadow-boxing.

11. Of Mountain Warfare in the Iranian Context: the northern mountains of Iran afford wide opportunities for demolitions. The unusually large number of bridges and tunnels which can be easily demolished, obviously enhances the defense and adds to its delay potential. Particularly important for Iran's defense is that demolitions could exhaust the Soviet engineering units deployed, particularly if the obstacles are well defended, and if Soviet engineer units are made top-priority targets. Attacks against the enemy engineering troops would be particularly effective given the unusually heavy demand of armored forces for engineer support in mountain terrain, and the relative scarcity of engineers in the overall Soviet force-structure. For the Iranians this would have favorable implications: either a Soviet underestimation of their engineering requirements, possibly leading to a Soviet inability to advance; or an increment to deterrence should the Soviets fully appreciate the heavy burden that would be placed on their scarce engineering units.
12. The delay and disruption of a Soviet advance is the obvious goal of demolitions but the latter could also contribute to the direct destruction of Soviet formations; in fact they could lead to demoralizing Soviet defeats if combined with fluid counter-attacks. Troops advancing in mountain terrain, whether they are attacking positional defenses or moving administratively in columns, are vulnerable to all the special stratagems of mountain warfare: induced rockfalls, contrived landslides and avalanches, all not only deadly, but also terrifying to the survivors. Demolitions are also useful in congesting enemy units whose advance is temporarily blocked and in isolating them from assistance (by demolitions on their rear) while they are attacked suddenly and unexpectedly (even by relatively small units). Non-combat supporting units are particularly vulnerable to such moves.

The only real protection against this tactic would be unpalatable for the Russians: the widespread dissipation of the relatively scarce Soviet infantry strength along the routes of march. This in itself weakens the Soviet thrust; and it also presents an opportunity for the Iranians to focus their attacks on the Soviet infantry, in the knowledge that once this component is defeated, the rest of the Soviet force will become particularly vulnerable.

13. The operational goal of an Iranian mountain strategy would be similar to those of a fluid armored defense (e.g. as practiced by the Finns in the forest/lake country of the far north): where the aim is to induce exhaustion and over-extension, to set the stage for annihilation (viz. the attrition of intact units). The enemy should be allowed to exhaust himself by pursuing apparent success; he is to be enticed into attacking (and flanking) successive roadblocks, the final block being the defender's own armored force covering the exits from the northern mountains. Until that phase, the defender's priority targets would be the Soviet engineers and infantry and not the armor. The main task of the static elements of the defense would be to prevent the breaching of obstacles, with a priority of effort against engineering equipment. It should also attempt to attack as much of the enemy infantry as possible, ideally while still mounted or in the process of dismounting from its vehicles. But this obviously requires tactical surprise which is hardly possible if the attacker is properly preceded by light reconnaissance elements.
14. The defense-preferred form of the Soviet attack would obviously be the frontal assault; the defense must be prepared for this eventuality, but it is much more likely the attacks will be flanking/enveloping moves on the ground, or by helicopter. Such attacks are vulnerable during the movement phase and it is the task of the fluid component of the defense to catch the enemy in disadvantageous circumstances, while his forces are still enroute.
15. The exhaustion and over-extension of the enemy, desirable goals in their own right, also fit into the larger scheme of maneuver warfare by being the pre-conditions for decisive counter-strokes. Soviet tanks and artillery - the prime targets in flatland warfare - should not in general be primary targets at this stage. Those components are not well-suited to mountain combat in any case, and their destruction

will come about anyway if the overall operation is successful. So long as these elements are intact, the enemy command will be impelled to press on. Hence a narrow-minded focus upon tank-destruction would misdirect the efforts of the defending force.

16. A critical decision for the defense is to choose the timing and form of the counterstroke. Should it be early and in the form of many repetitive attacks against the enemy column as it inches forward? Or should the defense content itself with pinpricking the columns by stand-off fire and demolitions until the invading formation is over-extended? From the purely military viewpoint, the latter course is more decisive. On the other hand, the political leadership may want to report early victories both for its own prestige and to bolster public morale.
17. In a fight between Iranians and Russians, it is important that successive blocking positions be held for significant periods. It may therefore be necessary to initiate smaller counterstrokes from the beginning. The risk is that the defense would also be exhausting itself, by having to attack into, (or in the proximity of) the armored vanguard itself, instead of softer targets to the rear. If the blocking positions are effective, the defense is much better served by biding its time. In that case the positional element need fight little more than a delay action, then to withdraw onto the flanks, to allow Soviet mechanized columns to move into a large scale trap. In both cases the counter-strokes then aim at the isolation and destruction of the soft elements in the Soviet supply columns. Thereafter, the columns can be progressively split up, and defeated in detail.
18. In such Iranian counterstroke operations, the over-extension of the Soviet columns is an intermediate goal whose aim is to force the vanguard to out-run its logistical support (or suspend the advance) and also to stretch out the combat units beyond their range of mutual support. In mountain warfare, over-extension accomplishes three purposes:

First (and most important) it allows the defender to cut off the hard mechanized elements by attacking soft spots in an extended chain of supply. If this line of supply is not quickly restored, the logistically-demanding armored elements may find themselves immobilized, or even forced to abandon their equipment.

Second, the enemy's effective frontage becomes 'U' shaped. His efforts are focused upon moving through the blocking positions but in doing so, his flanks become progressively weaker and more vulnerable to counter-attack. Time is then tactically on the side of the defenders.

Third, over-extension allows the defender to launch remote attacks by fire.

19. When enemy forces move into the "U", stand-off fires can easily be used to snipe at the attacker's infantry and generally wear down his strength. PGMs could add a new dimension to this by picking off the enemy's vehicles at long-range, in particular engineer (and infantry-laden) vehicles.
20. It is obvious that in mountain warfare the critical factor is the relative fluidity of the forces, i.e. the very antithesis of the presumed advantages of positional defenses as measured in relative firepower scores. In flat-land warfare, Clausewitz assumed equal fluidity; in the mountains he presumed an asymmetry in favor of the attacker. But if the temptation of adopting a positional defense with the resulting operational passivity is avoided, the Iranian defense can obtain two distinct advantages from the prior possession of the terrain.

First, supplies can be cached beforehand to increase the logistical autonomy and fluidity of the mountain infantry. Second by prior study of the terrain and skillful use of adjoining positional defenses, the defender can control in his favor the arena in which military operations will take place.

21. In a fight with a super-power, Iran would retain the advantage of specialization. It can design its military forces for the specific circumstances in

which it would have to fight while the Soviet Union cannot do so. Soviet forces and Soviet thinking are aimed at more dangerous adversaries than Iran. Thus the Soviet Army has a force structure completely unsuited for combat in mountains. Soviet "motorized rifle" divisions are not infantry at all but in fact heavily armored forces, a reality not much affected by the apparent training of parts of some of these units in mountain warfare. Soviet airborne divisions are more flexible but now seem to operate as light-armor forces. It is most unlikely that the Soviet Army would re-shape its standardized forces to match an Iranian shift to an agile mountain defense.

22. The Russians tend to be contemptuous of their smaller neighbors and expect them to oblige their might by a swift collapse. Further, Soviet planners tend to think in terms of handling smaller countries by coup de main operations. (The present Soviet force structure is very well suited for such operations.) Additionally, even if Soviet planners were aware of a possible problem it would be difficult for them to change their own force structure. A change in Iran would be unlikely to generate a sufficient impulse for responsive change until a moment of crisis, when structural change would no longer be feasible. In any case significant structural change to accommodate Iranian conditions is incompatible with the Soviet mobilization system. The Soviet army is oriented towards combat in open terrain against NATO and the Chinese. The cutting edge of their forces are the Category I divisions while their Category II and III divisions are only follow-up and space-consolidation forces. Creating a dedicated force for Iran would disrupt this scheme. Special Category I (and back-up Category II and III) divisions would have to be organized for Iranian (and similar) contingencies. This increases costs while reducing reserves suitable for NATO and Chinese contingencies. From the Soviet viewpoint, the latter two can threaten the security of the state while a certain degree of force-inefficiency in a secondary theater such as Iran does not.

23. This is the fundamental factor that allows the possibility that even a weak power such as Iran could defend itself alone against the Soviet Union-if that is, Iran can specifically organize its defense to take advantage of specific Soviet weaknesses, and of the contextual conditions.
24. It should also be noted that a mountain-defense orientation is compatible with Iran's remaining security requirements. A force structure oriented for mountain warfare would be cheaper, more easily redeployed and more effective in defending Iran's borders with Iraq and Afghanistan than the Shah's flat-land force structure. Iran would still need some armored forces to implement the mountain strategy and thus it would retain a capability to launch punitive expeditions into the Iraqi flatlands, even with a diminished armored component.
25. Of Internal Security Implications: a modern army with sophisticated weapons is much less suited for population-control than a force consisting primarily of light infantry. In armored forces too much of the structure is support-oriented while the combat forces themselves are far too heavy in firepower and far too destructive for effective population control. Finally, most governments in politically unstable countries find it necessary to fractionalize the command of their military forces and this makes it very difficult to exercise armored forces in the proper combined-arms manner; on the other hand a structure oriented towards mountain warfare is fully compatible with command compartmentalization for its nature has similarities to guerrilla tactics and the traditional tactics of the mountain population of Iran.

II.B.(iv) AN UNMET OPERATIONAL REQUIREMENT: DEFENSE
AGAINST A SOVIET COUP DE MAIN OFFENSIVE

1. From the Soviet viewpoint a coup de main offensive is the most logical form of attack against a weak military entity, such as the Shah's Iran in fact was. In such an offensive, the immediate military goal would be to paralyze the Iranian defensive system rather than the physical destruction of its forces. Initial success by surprise-induced paralysis would then be followed by a consolidation invasion (i.e., lightly opposed entry) and also by political action, to create an obedient regime.
2. The total form of a coup de main cannot be anticipated; while the generalized methods are known, their individual manifestations are not.* The initial and crucial aim of the coup de main is to create an overwhelming sense of helplessness by combining confusion measures (in the interior) with images of irresistible military forces soon to arrive.
3. An Iranian defense against a Soviet coup de main offensive must contain the following elements: First, media arrangements to dispel disruptive rumors. Second, a police/gendarme network to protect key installations and personalities, and to contain saboteurs and small air-delivered enemy raiding parties. Third, an air-defense system capable of inhibiting movement by air at least after the initial surprise. (The denial of the first air penetrations is not a realistic goal.) Fourth, ground forces capable of pocketing and then destroying large air-delivered groupings; and, finally, a capability to delay the movement of the main follow-up forces, invading across the border. Except for the third element, and that dubiously, the Shah's strategy did not provide what was (and is) needed to defeat the strategic-scale coup de main that the Soviet Union is fully capable of launching.
4. As noted above, the essential instrument of coup de main operations is not force as such, but rather the illusion of force, contrived by the attacker to undermine the defender's ability and will to resist. The classic German Blitzkrieg of 1939-41 was based on such effects, and even a full mobilization is not a sufficient response to the phenomenon.

* For an account of the ruses employed by the Russians in their December 1979 invasion of Afghanistan, see "Soviet Trick Disarmed Key Afghan Tank Units", Los Angeles Times, 10 January 1980, R. Tyrrell.

But whereas in Europe a coup de main is easy to mount due to the small distances involved and the dense transport net, Iran being a large country with few good roads has a degree of natural protection against this threat.

5. Notably, the geography of the country could make airborne assaults into the deep interior of Iran a risky proposition if a credible delay capability were at hand against the land invasion threat. The Soviets are unlikely to risk their elite airborne-assault forces in such circumstances. (It must always be remembered that Iran is only of secondary strategic importance to the USSR.)
6. To defend against a coup de main, Iran's first requirement is to deal with airborne assaults intended to create disarray in the interior. This task can be made easier by a good air defense, but sophisticated air defense is not a prerequisite and an overemphasis on air defense - as in Iran's case under the Shah - can be counterproductive by being at the expense of overall defensive capabilities. The most robust defense against airborne assault is not a high-technology air-defense system but rather quick-reaction "armored cavalry" forces on the ground, as well as an effective use of the gendarme system.
7. In a coup de main, the task of Soviet airborne-assault forces would not be just to seize and defend their own air LOC for subsequent reinforcement. Instead the air-head is only a means with which to launch immediate raiding operations - operations that cannot be launched directly from Soviet territory due to the distances involved. Air-landed Soviet forces would immediately send out small raiding groups to disrupt the Iranian reaction to the Soviet offensive as a whole. A few helicopters and some light-armor vehicles would no doubt be available to the initial air-landed force; but motorcycle troops might also play a role. (Motorcycle troops are now being increased in the divisional reconnaissance battalions of the Soviet army, while the Soviet airborne division itself has become a light-armored force.)

8. Many American analysts automatically discount the threat (or value) of light elements since such forces do not rate highly by the twin attrition criteria of firepower and survivability. But light elements would in fact rely on maneuver rather than on firepower. Their purpose would be to seize quickly points of logistic or tactical importance before the defense can begin to react. A multiplication of such position seizures can easily create an impression of omnipresence, spreading confusion and demoralization among the population and in the military command system. And the defender must then dislodge attackers who have appropriated the advantages of the tactical defensive.
9. Against raids and seizing parties emanating from an air-head, gendarmes and armored cavalry units are the most effective countering element. Iran's gendarme system - if rebuilt - offers the possibility of intercepting the smaller Soviet "desant" groupings enroute, as well as of guarding key installations (and personalities) before their arrival. Armored cavalry units would on the other hand provide integrated combat teams suited to deal quickly with larger "desant" groupings. The advantages of "armored cavalry" type forces are several. First, they can move rapidly. Second, they contain both heavy elements (for "fixing") and light elements for "working in". Third, and most important for a quick response - their battle team is already organically integrated. Otherwise time-consuming preparation is needed to organize coordinated forces out of distinct tank and infantry formations (oriented as these are for more formal methods of combat).
10. If the raiding tentacles emanating from the Soviet air-head can be defeated, the air-head itself loses much of its purpose. In fact, since it creates a need to achieve a ground-force link-up (and quickly) the air-head would then become a Soviet liability. For reasons of prestige and morale, the attacker must strive to sustain air-heads but if the ground link-up is prevented, and the tentacles have been destroyed, the air-head can no longer consolidate the initial gains - even if the necessary reinforcements are delivered. The air-head thus becomes a trap and resource-sink for the attacker, and in due course it can be annihilated.

11. However, even if an air-head is made useless by destroying its tentacles, it would still be necessary to contain it. In the case of Iran, Soviet air-heads would have to appear in the proximity of one or more of the crucial nerve centers (perhaps only Tehran itself is truly critical). An airfield is obviously a desirable target to facilitate subsequent operations, but it is not a necessary target. An airfield is only essential for the deployment of large forces and to sustain their prolonged combat and that of course would amount to a negation of the very purpose of any coup de main. Nevertheless it is obvious that one or more airfields could be initial objectives, for the air-delivered element of a Soviet coup de main.
12. To defeat the air-head force itself, the two important elements are rapid containment and low-level (gun) air defense. At least for the initial sealing off and containment of the air-delivered force, armored cavalry again offers the best prospects. It has two advantages over regular line formations. First it is more suited to sealing off the approaches from the air-head because its combat teams are organic. Second, armored-cavalry is designed in part for the ground-security role, and this would be important since Soviet air-delivered forces would seek to "flow" around any containing blocking positions. Only if it is deemed desirable to destroy the air-head in close combat, would regular line formations be more suitable.
13. As far as air defense is concerned, neither fighters nor sophisticated missiles are likely to be as important as automatic cannon (in close proximity) to contain a Soviet air-head. And these weapons could also serve as a major element in the containment and destruction of the air-delivered forces in ground combat.
14. The aim of the air-defense against Soviet air-heads would obviously be to prevent reinforcement and sustainment. In practice, this would be accomplished by making air landing and parachuting prohibitively expensive. This is therefore a task for low-level air defenses, still the recognized domain of the gun.

15. Enemy aircraft flying above the gun envelope at 10,000 feet or so could not reinforce the air-head nor could they provide it with close support. Nor would guided ordnance solve Soviet problems, since seeker devices would not work well against the low-contrast containment forces (including optically-directed AAA).
16. It is appreciated that a sophisticated air defense may be attractive to Iran to affirm sovereignty and to protect the air space from peacetime intrusions. But its real military usefulness in war would be circumscribed: in Iranian conditions it would be limited to inhibiting Soviet terror-bombing, and the easy targeting of high-contrast infrastructure targets. As far as the air-landed threat is concerned, the purposes of air defense could be accomplished by means much cheaper than the hyper-expensive panoply of AWACS, F-14s, F-16s and HAWK of the Shah's projected force-structure.
17. It must not be thought that a good air-defense could alone be sufficient to deter and/or prevent a coup de main (through the destruction of Soviet aircraft enroute to the objective). First, sophisticated air defenses are not robust against one-time countermeasures; second, any air defense is a 'sieve' system, which takes time to tighten; and third, the early detection of Soviet air activity by the air-defense control center does not automatically translate into timely warning for the ground. The time needed to identify the threat and disseminate warnings depends on the quality of the command linkages between the ground and the air forces (in the Shah's time, he was the link). Further, the time needed to act on any warning depends on the ability of the ground formations to form and deploy responsive battle groups. In the Shah's Iran, an air-defense warning would not have translated into a prompt and effective warning for the ground forces, except during special periods of alert (these of course could themselves cause a postponement of the coup de main). Thus even if the air defense system worked well from the first, a coup de main could still succeed.

18. The worth of Iran's sophisticated air defenses against the coup de main threat thus depends on two unknowns: the 'entry' price necessary to deter a Soviet attack, and the robustness (= effectiveness across the spectrum of possibilities) of the system itself, once the Soviets use all the countermeasures available to them. The combat effectiveness of highly centralized and electronically sophisticated air defense systems remains an open question. The U.S. Air Force pins high hopes on such systems, but it is noteworthy that the RAF and Luftwaffe do not, at least in the cluttered conditions of European warfare. An air conflict in Iran would of course be much less cluttered, but on the other hand much less scientific expertise has been devoted to the special problems of electronic-wave propagation in Iran. It is of course well known that the Soviets themselves are very active in electronic warfare while the Iranians are merely the recipients of electronic packages produced by others. Hence in any air conflict against the Soviets, there is a very high possibility that Iran's air defense system could simply be neutralized at least temporarily.
19. The other critical factor in a defense against a Soviet coup de main is the delay of the main invasion forces advancing to link up with the airborne "desant" elements. Against this threat, Iran has a distinct geographical advantage as compared to most other neighbors of the Soviet Union. The Iranian plateau is protected by a high mountain barrier (on the Iranian side of the border) which cannot be outflanked, and must therefore be penetrated. While there is legitimate argument over the merits of a mountain-based defense in protracted war, it is nevertheless clear that such a system is unambiguously advantageous as far as delaying actions are concerned. In mountains, defensive forces can significantly delay much larger and heavier forces through demolitions and direct combat.
20. Across the 1,000 miles of the Iranian-USSR border as the crow flies, there are only ten transborder routes suitable for vehicular passage (including the Herat route from Afghanistan). The immediate Soviet aim in a coup de main offensive would be to reach and reinforce the

air-heads before they can be destroyed by the Iranians. Since the Soviet army is not short of units, and since it would seek to maximize the appearance of strength, the Soviets would undoubtedly send invasion columns through most if not all of the routes. Some of these could be small, but all will be of sufficient strength to push through and secure thinly guarded routes, and to hold them until exploitation reinforcements could be brought up.

21. With time being of the essence, the normal Soviet procedure for the advance would have two shortcomings: first, their standard formation of march columns with advance guards and recce well forward is likely to act as a triggering mechanism for Iranian demolitions and, second the land routes from the USSR itself are too long, and - worse - they converge into only three approaches while still at some distance from Tehran. The Soviet advance is therefore more likely to be opened by light "precursor" forces, which would try to seize key points along several of the major routes. Lead columns aimed at Tehran might originate on the Caspian Sea, e.g. by amphibious landings at Chalus and Babol Sar. While most of the land approaches from the USSR converge most unfavorably from the Soviet point of view, a landing at Babol Sar would offer the choice of divergent paths so that reinforcement echelons could be swiftly assigned to any open route. This of course multiplies the effectiveness of the invasion force as a whole. This consideration, plus the fact that the initial link-up column would have as much symbolic as substantive military importance, enhances the attractiveness of the Chalus and Babol Sar approaches, even if only for small initial relief forces. As in any surprise operation, the safety of each "precursor" column would not derive from its own capabilities, but rather from the confusion generated by the offensive as a whole.
22. In such an operation, light "precursor" elements would seize bridges, tunnels, passes, and the like, in a variety of exercised "special operations." The key would obviously be to secure critical locations

before local Iranian forces (gendarmes or army) could react. In many situations, only guards would have to be overcome; in others it might simply mean posting Soviet guards before the gendarmes can move into their designated guard-posts.

23. "Precursor" forces could take various forms, but the most obvious possibility is the use of helicopter-borne infantry. Helicopters are of course ideal for landing small "desant" parties (flat-deck ships in the Caspian Sea could serve as platforms for helicopters). Helicopters based in the USSR itself would not have the range and carrying capacity to support the necessary surprise operations in the mountains bordering the Caspian Sea. Flat decked ships (which could be provided without loss of technical surprise) would solve this problem and would also be of use to support main forces moving along the coastal routes before turning into the mountains. Helicopter-delivered motorcycle troops could also be landed with "desant" teams to move quickly by road, thus adding another dimension of surprise.
24. The basic elements of the envisaged 'precursor' units are already present in the reconnaissance companies of the Tank and MR regiments, and in the reconnaissance battalions of the Soviet Tank and Motorized Rifle divisions.*

* The reconnaissance battalion TO&E includes a motorcycle platoon and also a long-range recce company composed of small teams. The recce company of each regiment has a small motorcycle scout section. In each unit, additional personnel are available to use motorcycles in scout-like operations. Thus in the standard formations engaged in an offensive against Iran, a considerable "desant" force would be organic in any case, and it would be available for "precursor" duties even if all airborne and air-assault divisions and brigades would be assigned their primary role, and would thus be unavailable. Out of the twenty-four divisions in the three military districts adjacent to Iran, Soviet TO&Es would call for as many as 1,700 motorcycle troops and 120 long-range reconnaissance teams. Even if divided among the ten routes into Iran, this force alone could be seriously disruptive. And, of course, there is no reason why this "base" could not be enlarged by the temporary assignment of recce units from the remaining 137 Soviet tank/MR divisions.

25. In addition to heli-borne elements, more traditional methods could also be used to seize and secure the entry-points of the road net; for example a subversive network of Soviet sympathizers could be created to be activated when needed. Dissident ethnics could also be exploited. Even commercial trucking (and tourism) from the USSR could be used for "Trojan Horse" operations. (The latter already provide ample opportunities for peacetime route reconnaissance.) The techniques these groups would use would be quite similar to those of the "desant" groups. The difference is mainly in the means used to arrive on location; one uses high-signature transport; the other covert means.
26. Some believe that the solution to the problem of surprise lies in high technology, i.e., sophisticated early-warning radars and other remote surveillance techniques. It is obvious, however, that these would only be effective against high-signature modes of transport. Such technology is certainly not effective against approach and seizure techniques which rely on cover and deception. It would therefore be unwise to spend large sums on sophisticated surveillance technology. There is even reason to doubt the effectiveness of high technology systems in countering heliborne penetrations. These systems can provide warning, but it is doubtful if such warning can be used in a meaningful military way, except to alert guards already in place. High-performance aircraft are not suitable for intercepting low-flying helicopters, and the early warning likely to be available (assuming Soviet deception to mask the operation until the launch of the aircraft), would not be sufficient to deploy ground air defenses suitable for use against low-flying helicopters.
27. While a Hind-like anti-helicopter helicopter and early warning systems would be useful for Iran, the only robust solution to the problem remains a force of guards capable of rising to the demands of the situation. Certainly, only guards can cope with 'desant' operations based upon cover and deception. A system capable of coping with these threats is also capable of dealing with clandestine penetrations of the border areas. There would be some merit in dealing also with the

highly visible, high-technology end of the spectrum, but the real focus must be on organizational rather than technical solutions, which are both cheap (as far as the hardware goes) and also militarily robust.

28. The safeguard against the precursor threat must be found in the gendarmerie system of internal security, which Iran has (or at least will have again, if and when order is restored). Iran's 70,000 + gendarmes are now distributed in many platoon, company or battalion-size outposts. Their primary duty is the maintenance of law and order. But their omnipresence also gives the central government a useful means of keeping remote localities under observation; it offers a quick-reaction guard capability, and finally a means of rapid alert and mobilization. The gendarme system thus offers a ready-made framework for disrupting desant-type operations. Their numbers in the mountain belt would have to be augmented, and they would also require prompt reinforcement by army units. Assuming manpower of tolerable quality, given automatic weapons and suitable training, gendarmes could make the quick seizure of bridges, tunnels, and passes rather difficult for the Soviets. Equally important, the gendarmes could be provided with an interception capability: to detect suspicious activity, to ambush the smaller desant groupings in transit, and even to use REDEYE-type missiles as well as automatic weapons against over-flying helicopters.

II.B.(v) THE TACTICAL LEVEL: A MODERN
MOUNTAIN INFANTRY

1. It was pointed out above that a positional mountain defense is normally as weak theatre-wide as it appears to be strong tactically. It was further noted that the key to victory is to achieve an advantage in the relative tempo of maneuver.
2. In theory, ordinary infantry liberally equipped with helicopters could achieve such an advantage (given a command itself quick-thinking); but once helicopter vulnerability vis à vis Soviet-style forces are taken into account, the better option will often be to deploy light mountain-infantry forces capable of considerable tactical mobility on foot. This would certainly have been the case for Iran (in spite of the Shah's very large helicopter acquisitions made or projected) and it is the case now for theatres such as Korea.
3. It has become the convention to divide U.S. Army and Marine forces into "light" and "heavy"; it is certainly true that the "heavy" forces (armored and mechanized divisions) are indeed heavy, but by any normal standards the "light" forces (infantry and airborne divisions) are not light at all. They are in fact entirely dependent upon heavy weapons which require in turn much logistic support.
4. The most obvious quality of mountain-infantry forces would be their light equipment. Such forces should be equipped on the lines of the Italian Alpini, whose heaviest weapons are 105mm pack howitzers (of 2,925 lbs total weight, divisible into twelve separate loads). Mortars - particularly useful in terrain with sharp contours - are especially important. Some of the simpler ATGMs and hand-held SAMs would be a necessary complement to such traditional mountain-infantry weapons. Given the terrain obstacle to radio communications in mountain environments, special provisions in this respect would clearly be needed also.

Certainly up to and including the battalion level, all equipment should be issued on the premise that it would have to be man-handled, (even if considerable helicopter support could in fact be made available).

5. It would be a mistake to believe that regular infantry forces in the U.S.-style could easily be converted into mountain infantry by merely offloading their heavier items of equipment. An altogether more difficult transformation of tactics would be essential also, for two reasons:

First: U.S.-style infantry and airborne forces are now trained almost exclusively to fight in a positional mode; their natural conduct once conveyed to the combat zone is to dig in, often in hilltop positions.

Second: U.S.-style infantry tactics reflect an attrition-oriented approach to warfare, carried to an extreme degree; in practice, U.S.-style "light" forces rely on the massive administration of firepower quite as much as the "heavy" forces.

It is precisely firepower-dependence that leads to positional tactics, in the expectation that superior firepower will be available to protect and exploit the positions (their function being to force the enemy to concentrate on the assault, thus forming convenient targets for the mass firepower of artillery or air attack).

6. A mountain infantry for Iran must in contrast be highly agile if it is not to pave the way for its own destruction by being too slow to be able to evade enemy turning movements.
7. In order to be really useful the mountain infantry must be agile enough to launch attacks against the soft supply columns following in the wake of armor-lead Soviet-style thrusts (or at least to attack the combat echelons themselves in hit-and-run style). This means in effect that U.S.-style "light" forces would have to be retrained ab initio, to function guerilla style - or if one prefers - in the manner of the

German infantry on the Italian front in 1943 - 1944. Artillery would still be needed, including heavy artillery at corps level. And at any one time a significant proportion of the total force would in fact be assigned to static positional combat. But there remains the critical requirement for a substantial agile element, constantly on the move between positions (and well beyond their perimeter) to launch flanking attacks, counter-flanking attacks and deep penetrations.

II.B.(vi) AIR POWER AND AIR DEFENSE UNDER THE
ALTERNATIVE STRATEGY

1. Under whatever strategy, Iran will always require some air-defense and some tactical ground-support capabilities. But the amount and type of airpower needed depends on the theatre strategy. Under the Shah's preferred theatre strategy for the armored defense of the central plateau (the "Delay and Wait" scheme) high-quality tactical airpower was essential. By contrast, the forward defense of the northern mountain barrier would require little in the way of offensive air power. Unless the USSR itself is to be attacked, there would be few targets that could not be destroyed more reliably by the ground forces themselves, using demolitions and both stand-off firepower and direct fire in fluid counter-attacks.
2. It is still a U.S. planning assumption that offensive airpower can be very effective in mountains. This reflects the belief that offensive air is a powerful instrument of interdiction, and that the effect of interdiction is in turn greatly enhanced by the restrictive nature of mountainous terrain. But as so often in warfare, what is apparently true tactically, is often not true operationally.
3. For Iran, the chief shortcoming of offensive air is that it does not relate well to the needs of a fluid mountain defense against a predominantly mechanized Soviet attacker. The object of the Soviet attacker would be to push his columns through the mountain barrier onto the plateau. On the other hand, the object of Iranian delay operations in which offensive air could indeed be useful - would be to cause the Soviet forces to expend time and effort against relatively small forces, by placing repeated blocks against the head of the columns. The tasks of Iranian airpower would then be to reinforce by fire the blocking positions, and, more important, to provide its own delay by interdicting the road-bound columns. On the other hand, since even

small forces can delay very large forces in mountains, it is also apparent there is a tradeoff between prior preparation and offensive air. Prior preparation is obviously the more cost-effective; on the other hand, it is also to be recognized that unanticipated situations will arise even in the best case, and that tactical air could be very useful in coping with such situations, until ground forces can be suitably deployed.

4. Delay in mountains amounts to a form of passive defense. This is a correct use for small forces, since only by relying on positional defenses (and demolitions) can such forces impose significant delays. The defender's main problem is the timing of withdrawals to successive positions. Early withdrawals undercut the purpose of the delay; late withdrawals lead to the possible loss of the forward forces to flanking movements by the enemy. But a combined positional-agile defense in mountains should not be passive at all, and its purpose is no longer merely delay; it is rather, the annihilation of the enemy's entire force. The target is thus now no longer on the attacker's spearheading armor units but rather his force as a whole, beginning with the "soft" elements.

5. Offensive air provides close air support (CAS) battlefield (BI) and deep (supply) interdiction. Of these, CAS can be used to complement positional blocking defenses; but it is not essential for the task. In fact, advancing columns are most reliably stopped by demolitions covered by fire. The tasks of firepower in support are to prevent the enemy from repairing or by-passing the breach and from flanking the defending force. Airpower is simply ill-suited for these tasks. First: its firepower lacks the continuity needed to cover obstacles and to counter local flanking efforts. Notably, tactical air can be circumvented by night movement. Even with good visibility, spotting and targeting the enemy's flanking infantry requires forward air controllers, while weapons delivery (and weapon effectiveness) are degraded by the steep slopes and ample cover provided by the terrain.

6. In mountain warfare, deep interdiction loses its raison d'etre. In normal flat-lands warfare, the purpose of supply interdiction is to reduce the size of the force that can be sustained in combat. Airpower cannot be expected to completely stop the movement of supplies; the feasible aim is at most to cut the supply tonnage to some fraction of full capacity. In practical terms, since even a thin transport grid can support entire army groups (e.g. on the Eastern Front in WWII) and a single modest road an entire army (e.g. Africa Corps and British 8th Army), supply interdiction reduces supportable forces from "armies" to "corps". If the Soviet attacker has broken onto the Plateau (or is attacking into the Zagros), this reduction would be an important consideration, particularly if there is a "reinforcement race" with U.S. deployments.
7. But road capacity in the deep rear is not a constraining factor when the fight unfolds in the mountain barrier. There it is the narrow passages that condition movements to begin with. The force being fought is only the very tip of the column - basically a battalion-sized task force. It is only this 'battalion' tip that will be demanding the full array of supporting services. In breaking through the mountains, the entire Soviet force stretched in "administrative" column behind the tip battalion can be no more than 1 - 2 divisions. This means that the total force will be operating well within the tonnage capacity of the communication line. Thus supply interdiction is not likely to have a meaningful impact until after a breakout onto the central Plateau (when larger Soviet forces would be assembled for sustained combat).
8. Battlefield interdiction (BI) too, is unlikely to be very useful in the context of a fluid infantry defense against a predominantly mechanized Soviet attacker. Battlefield interdiction against an attacker has two functions: disruption and isolation on the one hand and the attrition of enemy elements on the other, as a by-product. For a positional defender, the purpose of battlefield interdiction is to disrupt the

attacker's planning and coordination and the flow of reinforcements necessary to exploit success. The subordinate aim is to prevent the enemy from transforming tactical into operational success, thus in effect easing the demands on the defending ground forces, and providing time to position them advantageously. As in flat-lands combat, tactical airpower can be a useful complement. The difference is in scale: in flat-lands, large forces are involved; there is thus not only a large pay-off in disrupting coordination and the flow of reinforcements but also considerable firepower is needed, and this can generally be done only by air power. In the mountains, however, the forces involved are smaller, coordination is accordingly simpler and presents less opportunity for disruption, while on the other hand even small groups of defenders can prevent the conversion of tactical into operational success with modest volumes of ground firepower.

9. In counter-attacks, the purpose of BI is again disruption and isolation, but with the emphasis on the isolation of the battlefield, both physically and psychologically. The mountainous terrain reduces this task to the creation of blocks on the road so that column segments can be isolated from mutual support and attacked in detail. Tactical air power is suitable for this task; but the task is done better still by ground roadblocks and demolitions to provide continuity and to create the impression as far as the offense is concerned that his forces are being surrounded and attacked by overwhelming force. Tactical air cannot be used in direct support of the counter-attack itself, because of the proximity of the attacking troops of the defense.
10. All this means that in the asymmetrical struggle between a fluid (infantry) defense and an attacker basically structured for armored combat, there is little need for offensive air support. The ground forces do not really need the supplemental firepower that tac air provides; rather the problem of the ground forces is to cope with stratagems and flanking movements - and for this tactical air offers little help. Similarly the disruption power of tactical air yields little that the ground forces cannot provide for themselves.

11. Further, disruption itself is also less significant in mountain warfare. It is to be recalled that its two potential benefits are first to reduce the effectiveness of assaults and second to impede the flow of exploiting reinforcements. In mountains, positional forces are not significantly helped by reducing the effectiveness of frontal assaults against them, while fluid units can be positioned in depth to block successful penetrations along the road axis without need of airpower for this task.
12. In any event, any Iranian defense scheme that were dependent on airpower would be very unreliable. Against the Soviet air force, the Iranian air force would be too fragile and likely to be lost early, thereby compromising any defense dependent upon tactical airpower. In the Shah's day, American airpower could have filled the void, but it should be noted that active U.S. participation would undercut a conditional defense, since the Soviet Union would no longer be dissuaded by the embarrassment and cost of becoming bogged down in a secondary theater against a third-rate opponent.
13. In the above discussion, airpower was treated as more than just air-delivered firepower and its disruptive possibilities were explored, and found wanting. Many, however, believe that airpower can be so destructive that its firepower alone can justify its existence. This raises the question of the destructiveness of airpower in mountains. Air-ground targets can be classified on a spectrum of difficulty: the most difficult are small and dispersed infantry groups infiltrating at night in mountain terrain; the easiest targets are high-contrast positional defenses. In between the two are targets such as bridges, and vehicles on the roadnet. It is obvious that tactical air cannot cope with the first set of targets. It is equally obvious that tactical air can readily target high-contrast positional defenses. The critical target category, however, is the roadnet.

14. It is not at all clear that limited payload tactical aircraft can in fact attack effectively vehicles or bridge-like targets in highly mountainous terrain. In such terrain the road net and the vehicles often do have high contrast. But the locations are generally masked by the terrain itself, thus seriously complicating target-acquisition and weapons delivery. Where the road twists and turns, there is a problem of intervisibility in targeting vehicles. But the more general problem is that a road running inside the folds of the mountains can readily be masked by wafting smoke from generators or pots, without affecting visibility on the road itself. Even light masking can defeat target-acquisition from high-flying aircraft which seek to deliver optically-guided PGMs. (Similarly IR-guided PGMs can be defeated by decoy hot spots set along the road.)
15. To be sure, suitable aircraft could fly right into the haze to acquire their targets. But it is obvious that jet aircraft can only do this at considerable peril in reduced visibility. For example, F-4s are not maneuverable enough to fly in close mountain terrain while A-10s lack the thrust to avoid sharp contours. In addition to the danger of flying into the mountainside, pilots must also fear cross-fires from automatic guns and heat-seeking missiles shooting down from the ridges along the flight paths to the more obvious targets like bridges.
16. There is also the question of finding suitable munitions for low-flying aircraft. As against tanks, only the A-10 has a suitable weapon with its 30mm GAU-8 cannon. Tanks and other armored vehicles can be protected against cluster submunitions by "chicken-wire" detonating rigs while unguided "iron bombs" have CEPs much too large to be useful against armored vehicles. (Though they could be useful for starting rockslides and the like, which in practice is the most productive tactic for aircraft, but which requires large payloads for effectiveness)
17. Operationally, the usefulness of offensive air power greatly depends on the enemy air defense. Against Soviet combat formations with their considerable organic air defense, tactical airpower may simply be neutralized. In fact offensive air could only be effective against

the attacker's softer logistic formations which generally lack escorting air defenses. This, however, amounts to supply interdiction which is only of value against an enemy that had already crossed the mountain barrier to reach the central plateau.

18. Of Defensive Airpower Under the Mountain Strategy: while offensive air may not be of particular value for a defender, it is nevertheless true that air defense remains of paramount importance. This follows from the defender's need to base his blocks on (readily targetable) positional defenses vulnerable to air attack and from the attacker's need for helicopters to mount flanking movements and to cope with the defender's fluid counter-attacks. What results, however, is primarily a ground air-defense requirement. A fighter air defense provides a psychological uplift to the ground troops and is sometimes instrumental in maintaining their resolve. Fighters, however, cannot cope with terrain-hugging helicopters while in any case any Iranian fighter defense would soon be worn out by the superior weight of Soviet air power. Much of the air-defense requirement should therefore be handled with light automatic cannon and simple missiles of the REDEYE variety. For the positional defender the main task of air defense (as always) is to enforce stand-off distances in order to degrade the enemy's delivery accuracy (already degraded by terrain conditions). Large numbers of randomly dispersed small patrols with machine guns and REDEYE missiles could make Soviet helicopter operations simply too costly given the degraded performance of helicopters at high mountain altitudes, and their inability to overfly the light missile and light gun weapons envelope.
19. While the positional elements of the defense need air defense, the fluid infantry component is not at all vulnerable to tactical airpower. The major threat to the fluid elements is from Soviet infantry, delivered by helicopter after their location has been discovered.
20. Under this theatre strategy there would still be a (diminished) air defense requirement for the LOCs. But this requirement is alleviated

by the general difficulty of targeting where roads run within deep folds of the terrain, and also by the attacker's desire to capture the road net more or less intact. Under a mountain defense scheme, dependence on the road net is minimized to begin with by the prior caching of supplies, and by the ability of the forces to withdraw cross-country, when positions are flanked and made untenable (the main Soviet tactic to be expected). In general, the defenders will be more willing to allow the LOC to deteriorate. The strategy here presented would allow the attacker to push into the depth of the mountains, to absorb his engineering capability and troop labor effort on a partially destroyed LOC, while withdrawing onto the flanks in preparation for later counter-attacks against the flanks and rear of an over-extended mechanized force. It follows therefore that air-defense for the protection of the Iranian LOCs would not be a high-priority requirement under this theatre strategy.

II.C. THE TERRITORIAL DEFENSE ALTERNATIVE

1. Iran's advantages for this option are the harshness of the terrain and the hardiness of its peasants. The purpose of a Territorial Defense - at least in pure form - is to make a country too costly to occupy. In the past, this strategy worked even for small countries such as Holland. In today's world it is only likely to work for very large and ethnically homogeneous areas such as eastern China or for smaller countries of secondary strategic importance and with a highly inhospitable terrain. Iran without oil would readily satisfy the second condition; Iran with oil and in proximity to the Persian Gulf (with more oil) no longer satisfies the second condition.
2. The essential element of a protracted territorial defense is an armed populace ready to use informal small-unit tactics against an enemy in its midst. Such tactics are usually of the hit-and-run variety, the aim being to demoralize the occupying force while never allowing it to exploit the full capacity of its weapons and military organization. Only in those forms of territorial defense which shade into regular military defense would militia elements fight directly with regular enemy formations. In such cases, their survival would depend on their being unusually well-entrenched; their role would be to hold or distract within the context of a larger operation mounted by more agile regular forces.
3. The operational forms of territorial defense range from the present West German model of territorial units which are in effect mobilized reserve formations, to outright guerilla warfare in the pure Maoist sense. In between these two extremes, three models are significant: (i) the system that the West Germans are evolving, i.e. forward space-occupation by territorial formations, while active formations are concentrated for counterstrokes; (ii) the Finnish model of regular

field army units using fluid, almost guerilla-like tactics in a spacious land of forests and lakes; and (iii) the Yugoslav model, where the active army is only the time-gaining adjunct for a broadly-based system of local-defense forces.

4. An obvious difficulty with the territorial-defense option is political: specifically its impact on civil order. Yugoslavia like Iran has dissident ethnic groupings in its population and, this problem has been recognized by organizing the territorial-defense system around the ethnically homogeneous Republics. In the Shah's day, any system that would depend on an armed populace would obviously have been unacceptable. Nowadays it is the ethnic heterogeneity of Iran that prohibits the option.
5. A territorial defense does not exclude the concurrent deployment of regular forces also. For Iran, a territorial defense would only be suitable against opponents (e.g. the USSR) with objectives transcending Iranian territory. Against invasions by less capable neighbors seeking territorial gains, a protracted territorial defense could be a useful adjunct but would not be sufficient. Accordingly even if Iran were to organize a good T.D. system a requirement would still exist for a regular establishment, albeit not necessarily as large or as dependent on high technology as the Shah's preferred force-structure.

III. ATTRITION ORIENTED AND RELATIONAL-MANEUVER FORCE-STRUCTURES IN A DIRECT COMPARISON

III.A. GENERAL CHARACTER OF RELATIONAL FORCE-STRUCTURES

1. While the fact is not widely recognized, the demand for advanced high-technology weapons derives in great part from prior choices in the preferred style of warfare. Even with identical estimates of the magnitude, composition and immediacy of the threat, sharply different weapon requirements may arise, depending on the character of the chosen operational methods and their place in the attrition/maneuver spectrum.
2. In the attrition style of warfare, the enemy is treated as a mere array of targets. The goal is to cumulatively reduce this enemy by administering firepower of sufficient volume and accuracy. While attrition tactics are simple, routinized and undemanding, and their results are quite reliable - so long as the enemy chooses to operate in conveniently targetable mass formations - attrition methods do generate demands for combat aircraft with large payloads, battle tanks with large-caliber guns and much artillery. Above all, this style of warfare absolutely requires either superior technology or a net matériel advantage overall (given such methods, there is a linear trade-off applies between force quantity and technological quality).
3. The technology-driven attrition approach is familiar since it is the style of warfare followed by the U.S. armed forces in both World Wars and still now; it is familiar to the world since it has been disseminated by U.S. military assistance and weapon-selling programs. As a matter of fact it is not widely recognized that there is an alternative, i.e., the relational-maneuver approach. Associated primarily with the German army at various times in its recent history, and lately with the Israeli armed forces, as well as with virtually all irregular/guerilla forces, the starting point of the relational-maneuver approach is the assumption of material inferiority. In such conditions, the operational aim must be to

exploit any identified shortcomings in the enemy's array of forces and also any advantages of locale and terrain; instead of applying strength upon the enemy's main strength as in the attrition style, localized and specialized strengths must be inserted into the identified weak points of an enemy array, which may be greatly superior overall.

4. While attrition methods and tactics tend to be standardized and homogeneous, relational-maneuver must be enemy-specific, responsive to the cultural milieu and highly attuned to terrain factors. In ground warfare for example, attrition-oriented forces prefer to fight from well-organized positions in order to coordinate their firepower more easily. Their tactics therefore tend to become static, and their operations passive in character. In the attempt to exploit battlefield terrain advantages, such forces normally violate the Clausewitzian precept: they seek to use terrain to magnify local (micro-defensive) effects, instead of using terrain in the (macro) framework of a larger system encompassing the whole theater, in which a maneuver defense would seek to dislocate the attacker, compartmentalize his forces and counterattack at opportune moments.
5. In ground warfare, relational-maneuver forces emphasize the macro framework of a larger system because any relational defense must be based on dislocating (viz. merely destructive) counterattacks. Thus in relational systems the offense/defense dichotomy is invariably false at any level below the strategic. In both the offense and the defense relational forces use time and terrain to compartmentalize the opponents' forces, to be able to defeat them in detail, and thus to induce a collapse of his overall system. The offense/defense difference is merely a matter of timing: on the offense, the relational attacker has the first move; in the defense, it has the second move. In the first case it uses deception, surprise, and a time-of-reaction advantage to obtain results; in the second, terrain obstacles (natural and manned) are important.
6. For the purposes of arms control it may therefore seem that the adoption of a relational structure would be undesirable. By nature, they must be more aggressive and more capable on the offense than the more passive

attrition structures. On the other hand, it must be noted that relational structures are inherently much less destructive, both on the battlefield itself and in the national heartlands also. It was not by accident that the attrition-oriented RAF accepted the Douhet thesis of city bombardment, while the Luftwaffe emphasized the tactical use of airpower.*

7. Since attrition structures aim at cumulative destruction they are normally more destabilizing and provocative than lower profile, but actually more offense-oriented relational structures. The first implicitly aim at the exhaustion of the home front's will and ability to fight; the second focus upon defeating the opponent's forces in the field by disruptive maneuver. Thus attrition structures tend to call for large weapon systems capable of wreaking great destruction, and notably high-payload offensive aircraft; relational structures by contrast rely on equipment in general to a smaller degree. Thus in ground warfare, attrition methods require much artillery, while maneuver methods stress mobile weapons including tanks. The tank has become the very symbol of the offense, but in of itself it is not a weapon that can inflict great physical destruction. In any case in maneuver tactics it is used more to outmaneuver opponents than to destroy enemy forces in any physical sense.
8. For any level of substantive military capability, relational structures will tend to require less complex equipments than attrition structures. This follows from the fact that the former are specialized to the context while attrition structures on the other hand rely on maximizing capabilities and attributes.
9. A relational-maneuver response to any given threat thus generally results in a greatly reduced demand for large and complex high-technology weapons, as compared to attrition responses to the identical military need. There are however, exceptions: a fluid armor method as used e.g. by the German army in 1939 - 1942 against would-be stalemating infantry methods, will be more demanding of weapon technology, though this would be offset by the strategic bombers and naval-blockade forces that a stalemating

* Its misuse for the London "Blitz" notwithstanding,

strategy calls for. The general presumption, however, is that context-specialization requires simpler equipment than generalized capabilities, and that the tactical fluidity associated with relational methods substitutes for the elaborately integrated firepower of attrition structures (which have come to rely increasingly on expensive and highly complex C³ electronics). Certainly a light 'mountain' infantry is cheap to equip, and equally an armored force structured to use fluid tactics will tend to be cheaper than an attrition-oriented armored force that relies on highly complex target acquisition, data processing, and stand-off weapons delivery for its military effectiveness.

III.B. KOREA

1. A relational-maneuver defense of South Korea vis a' vis North Korea would necessarily resemble the present structure at least in formal terms. The main change would be to moderate the current over-emphasis upon set-piece, firepower - based defense tactics. As noted in Section I.B.(iii) above, the ROK Air Force and Navy could also be made more relevant to the specific tasks at hand, at a considerably lower cost than the present U.S.-pattern forces, thus releasing resources which are certainly needed to strengthen the army.
2. The dilemma facing the ROK army is classic, and indeed it was familiar to Clausewitz:* a cordon defense of every inch of territory is a political imperative but the very attempt to deploy in this fashion induces fragility in the defense as a whole. The ROK army must find a way of holding territory well forward, while reducing its present vulnerability to fluid penetrations by enveloping light-infantry forces.
3. Partly because the North Korean light-infantry has been regarded as a rear-area security threat, as opposed to a front-line threat, the ROK's response has been to further strengthen the cordon, partly by infusions of high technology (e.g. more sensors to detect "peacetime" infiltration) and partly by adding more firepower to counter full-scale infantry on-slaughts.
4. Once it is recognized that the light infantry could be employed to set the stage for the heavy main-attack forces, another solution emerges: to trap the light infantry and channel the main forces. This is similar to the tactic of venting (or side-stepping) attacking armor - standard practice in all modern maneuver-oriented armies. In this method, instead of trying to stop the attacker forward of defensive positions, the enemy is allowed to penetrate between defensive positions, which then serve as pivots for counter-attacks. In the case of Korea specifically, since a "forward" defense is imperative, and since the terrain is so readily

* On War, Book 6, Chapter 22, pp. 453 - 455 (Edition Cited).

defensible on a micro basis, the pivots would also have to be deployed as strong-points, with all-around defenses.

5. A relational defense based on a combination of fortified strong-points and agile infantry for counterattacks would be cheaper than the present attempt to defend in a linear fashion with a general-purpose U.S.-style force-structure. Formations could then be specialized, some being configured to operate from within fortifications and some for counter-attack. Restructuring the ROK army on this basis would release the manpower needed to form the additional counterattack units. If still more manpower is needed, larger gaps could be accepted between the strong-points, so long as mutual fire support is retained. In addition, a restructured force would benefit from the resources (particularly hard currency) released from the ROK Navy and Air Force once these are also re-structured in a relational style.
6. The strong-points of a relational defense would also usefully employ older reservists. Physical demands on such troops would be limited, and once the basic tasks are learned, only minimal refresher training is required. Under a fully-developed relational system, the active army could specialize for the counterattack role and for stiffening the fortified zones. In the rear, to maintain an alert defense against surprise attack, only small mobile forces would be necessary. In the forward zones, a relatively large cadre could be supplemented by the billeting of active-army counterattack units in peacetime. In wartime, areas not being seriously attacked could be defended primarily by reservists, thus releasing counterattack units for duty elsewhere.
7. The command-and-control system of such a structure would be much simpler than the present highly centralized, and firepower-dependent structure, whose C³ are now being modernized. The defense of strong-points would be based on in-perimeter weapons, in particular mortars for indirect fire. The more complex C³ task in a relational structure is the coordination of the counterattack forces with the artillery and with the strong-points. This task, however, would be simplified by the nature of the tactics used:

against infiltrators, neither concentrated forces nor extensive fire support would be needed; against the heavier main forces, "venting" tactics call for pocketing the attacker into "killing zones" and for flanking counter-attacks (especially of the trapping variety, in which the counterattack units move around the outside of the pivot strong-points). Such maneuvers require a quick response to emerging opportunities. This, plus the presence of the pivots and the compartmentalized nature of the terrain, would limit the need to assemble large counterattacking forces. Multi-brigade operations (which require correspondingly sophisticated C³) would only be called for in the main "invasion corridors" leading directly to the Seoul area. There the terrain is less micro-compartmentalized, but since there is an obstacle and fortification system, the size of the required counterattack forces for local defense would be reduced. Only the counteroffensive that could be launched after the attacker had over-extended himself in the obstacle and fortification system would call for elaborate C³.

III.C. IRAN

1. As noted above, a relational-maneuver defense of Iran vis a'vis the Soviet Union would be based on the use of agile mountain infantry (to hold the northern barrier of mountains) instead of armor-mechanized forces deployed further back to fight it out on the plateau. And once that choice is made, rather thin air defenses can suffice, since Iran's ground forces would not then present many lucrative targets to enemy air attack. By contrast, if primary reliance is placed on armor-mechanized divisions, a thick and sophisticated air defense is essential, since such forces present many high-contrast targets of high individual value.
2. Defense against the Soviet Union is by no means the only perceived security need in Iran's defense planning. But it is obviously the most demanding. As such, it best illustrates the potential of relational/maneuver methods in making possible a defense just as effective (and often much more resilient) even while generating a greatly reduced demand for expensive (and provocative) high-technology weapons. The resulting structure is also more appropriate than the Shah's U.S.-style forces to meet Iran's remaining military requirements.
3. In terms of specific force structure changes, a relational deployment strategy would have reversed the Army's mechanization program, reduced the numbers of sophisticated combat aircraft, and converted the navy into a coastal-defense force based on large numbers of small fast attack craft, with perhaps a few frigates for "flag showing", and to sustain a presence in the Indian Ocean. Only two high-technology components would still be needed: ground air defenses and the helicopters.
4. Army. The size of Iran's army was by no means disproportionate to the size of the country's population; in any case, military service could obviously function as a modernizing school for the country's peasantry. Thus the manpower released by relational restructuring would be retained to form more line units rather than disbanded. On the other hand, the level of investment and O&M funding would greatly decline and so would the demand

for (scarce) technicians. As opposed to the Shah's planned structure of three armored and three mechanized divisions, one separate armored brigade, three special-purpose infantry brigades, and an Army aviation command, a relational structure would eliminate the division echelon and would be composed of the following major elements:

(i) A Mountain Corps of:

14 Mountain Brigades, each of 3 bns. 1 mortar btry.,
1 sapper coy.

6 Anti-tank Battalions
2 Mortar Regiments

(ii) An Armored Corps of:

3 Tank Brigades, each of 3 tank bns. (42 tanks each),
1 mech bn., 1 mort bty., and
1 eng. coy.

4 Independent Tank Battalions (42 tanks each)

(iii) A Light-Armor Recce. Corps. of:

5 Light-tank, Recce. Regiments, each of 2 light-tank bns.,
1 inf. bn. (2 mech. coys, 2 motorcycle
coys), 1 mort. btry. and 1 eng. coy.

(iv) An Intervention and Guard Corps of:

2 Airborne Bdes, each of 3 bns., 1 AT coy., and 1 mort. bty.
2 Guard Bdes, each of 3 bns., 1 AT coy and 1 mort. bty.
2 Special Forces Bdes., each of 3 bns.
2 Anti-Tank Bns

(v) An Artillery Command of:

1 Mortar Regiment
3 Light Howitzer Regts. (54 guns)
2 Medium Arty Regts, towed (54 guns)
1 Medium Arty Regt., SP (54 guns)
1 Heavy Arty. Regt., SP (54 guns)

(vi) Aviation Command.

(vii) Engineer Command.

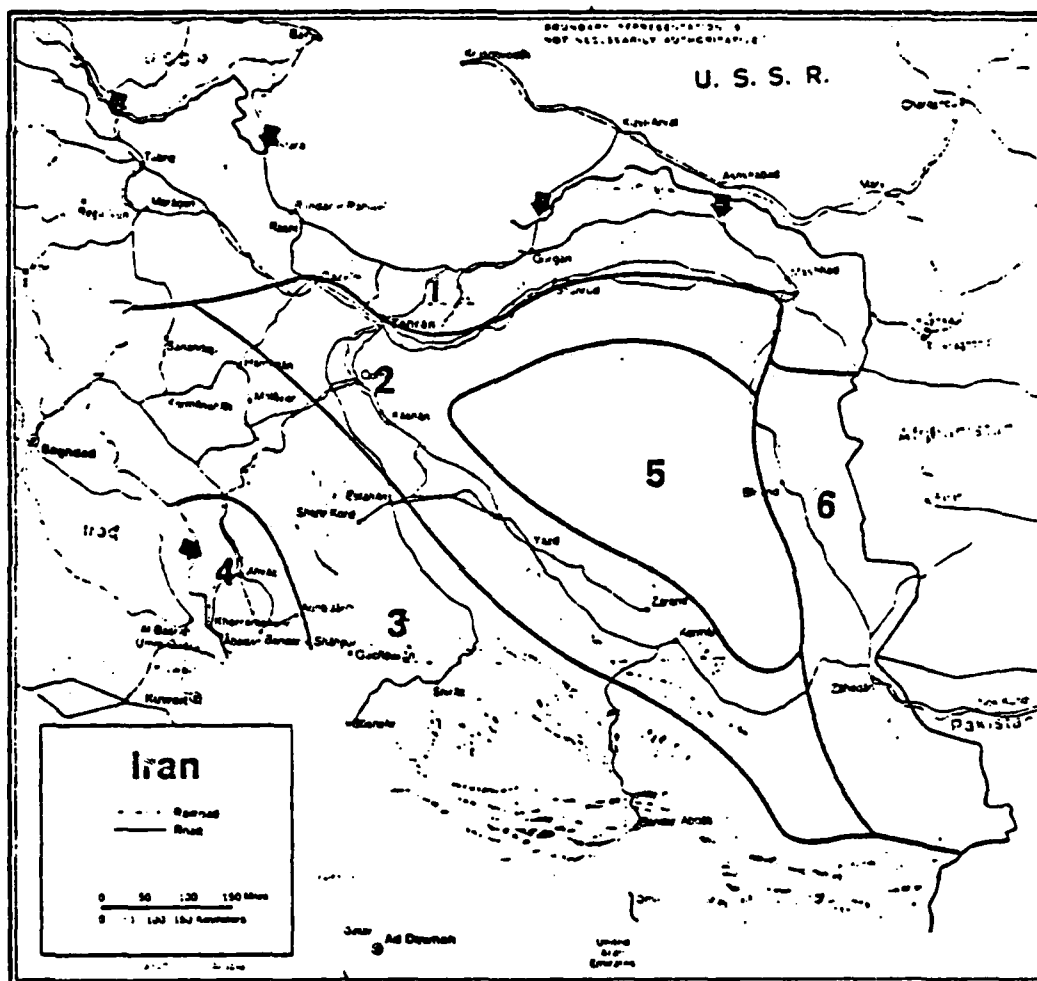
5. This structure would provide 29 brigades as opposed to the Shah's 22.* But tank and artillery inventories would be cut by 65 percent, as would the APC inventory. On the other hand, inventories of light and heavy mortars, light tanks, sapper engineers, anti-tank and automatic infantry weapons would have been sharply increased. The helicopter and ground

* Military Balance 1979 - 1980, op.cit.

air-defense inventories would remain essentially unchanged, except for the HAWK inventory that could be sharply reduced.

6. In a relational defense, the Mountain Corps would be deployed in areas 1, 3, and 6 of Map 1, oriented towards the Soviet and Iraqi borders. Two tank brigades would be billeted near the Iraqi border and the third would be west of Tehran. The four tank battalions would be garrisoned in the interior, with at least one in the oil producing area (4). Of the five *recce* regiments two would be garrisoned with the two tank brigades on the Iraqi border, one in the north west, one on the south slopes of the Elburz and one in the Tehran region. The six brigades of the Intervention Corps would be the "swing" force, in conjunction with aviation command, their peacetime deployment being centered on Tehran.
7. Such a deployment plan would be responsive to Iran's security needs - (internal as well as external) while still sufficiently dividing the army's command to minimize the danger of a military threat to civil control. The military-region hqs. would have operational control of the forces assigned their region, but ultimate command would be vested in the type Corps and Command Inspectorates. The capital region would in fact be garrisoned by elements of all the Corps.
8. The organization of the army in such a matrix will undoubtedly cause frictions between senior commanders. Indeed its purpose is to inhibit their coalescence against the civil government. Separate commands need not impair combat effectiveness, however, provided that links of coordination are maintained. The artillery for example has been separated from line units to create a vulnerability should a line commander divert his unit against civil authority; but artillery's coordination with line arms would still be assured in wartime through Fire Direction Centers attached to the mortar battery of each line unit. Similarly the elimination of the division echelon and the resulting decentralization need not reduce military effectiveness even as it weakens the direct control of senior commanders. Fluid warfare requires decentralization if arising opportunities are to be exploited while the need for lock-step coordination among many units is reduced. Accordingly, decentralization

PRINCIPAL GEOGRAPHIC REGIONS OF IRAN



- 1. NORTHERN MOUNTAINS
- 2. CENTRAL PLAINS
- 3. SOUTHERN MOUNTAINS

- 4. MAJOR OIL PRODUCING AREA
- 5. DESERT
- 6. EASTERN MOUNTAINS

◆ MAJOR ATTACK ROUTES INTO IRAN

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can increase military effectiveness as the very nature of the organization forces decisions to be made at lower levels.*

9. Most military actions by Iranian forces will be at the brigade level or lower. (Internal security usually calls for sub-unit operations.) Even an organized insurgency would not require coordinated multi-brigade operations. Similarly any Iranian intervention operations in the Gulf region are unlikely to require multi-brigade forces. The only situations that would require large-scale combat would be war against Iraq or defense against the Russians. As for the latter, Iran can only mount a delay and counterattack defense of the mountain barrier. The latter would indeed require many brigades, but it would seldom involve coordinated multi-brigade operations. Only if Iran attacks Iraq would multi-brigade combined-arms operations be required. An ad hoc Task Force can in theory perform this function just as well as a formalized division staff. Which of the two command arrangements is preferable for Iranian forces is an empirical question not to be answered in theory. In the past Iranians - as most non-European armies - have found all-arms coordination most difficult to achieve; armored warfare, which requires maneuver as well, is even more difficult. A divisional operation which is poorly coordinated is likely to be sluggish and less successful than a more loosely coordinated Task Force relying more on the action of the brigades with their own internal initiative. Against the sluggish Iraqi divisional forces, a more fluid task-force structure is likely to be preferable.

10. The Aviation Command would assume new importance given restructuring on relational-maneuver lines. Except in defense against the Russian, the gunship - and - transport helicopter can be a force multiplier. For

* A system of controlled initiative, beginning with decisions made at junior officer levels but closely monitored by the chain of command, is a major determinant of the overall effectiveness of relational-maneuver ground forces. In both the German and the Israeli armies which have been the high priests of this method, the physical presence of commanders (all levels) is required in the points of possible opportunity (Schwerpunkt, literally center of gravity), but elaborate communications are not required. Acting under "mission orders" that specify only the objective but not how to attain it, junior commanders are given full freedom to seize opportunities, whose subsequent exploitation shapes the battle.

internal security and intervention tasks, it adds a third dimension to ground warfare, and therefore a degree of flexibility previously lacking. Against the Iraqis, the helicopter could enable relatively small armored forces to outmaneuver and defeat larger but more sluggish Iraqi armored divisions.* Heliborne light infantry can assist tank operations by facilitating their movement around and through enemy defenses and the helicopter also provides a means for quickly bringing in infantry to protect flanks, and to consolidate new positions.

(i) How Much Tactical Airpower?

1. The amount and type of tactical airpower needed is very much a function of theater strategy and of the type of ground force that is deployed. For example in Iran's case an armored defense on the central plateau allows full play for tactical airpower: friendly armor must be protected, and the enemy's own armor and lines of resupply are vulnerable to air attack. On the other hand, a defense of the Zagros Mountains would reduce the need for friendly air defense while increasing the scope of offensive air against an invader now stretched out across poor roads in the mountains and plateaus. But of course such an enclave defense in the Zagros would entail the abandonment of more than half of Iran's air bases. As for a Territorial Defense, that by definition would require no offensive air support at all.
12. Iran will always require sort of air-defense to affirm sovereignty, to protect its air space, and to inhibit terror - and countervalue-bombing. Deterrence against Iraq requires that Iran have similar countervalue capabilities. But capabilities of this order do not require an air force of the size and sophistication of the RAF or the Luftwaffe; a "Belgian" or "Dutch" air force would suffice for these purposes. If a larger air force is nevertheless desired, consideration should be given to the deployment of updated versions of such strafing aircraft as the A-1s or the Mustang. These aircraft are cheap, easy to maintain, and could be

* The gun-ship is particularly effective against strung-out and unsupported tank formations. The many quantitative studies that show high helicopter-to-tank kill ratios implicitly assume this context - an assumption that is not valid for central Europe.

particularly effective in Iranian conditions. They can assist the army in the lesser military contingencies, and also serve effectively in mountains, where sophisticated high-performance aircraft would not be effective. If dispersed on small strips on the deep flanks of likely Soviet approaches, they could also be effectively used against rearward supply columns and also against the precursor elements which would precede and broaden a Soviet advance.

13. A country such as Iran cannot expect to defend its air space against the Soviet Union. It can at best affirm sovereignty, a matter more of appearances than of substance. Against other neighbors and especially Iraq, air-space defense is certainly required to maintain external (= regional) and domestic credibility. This second requirement is therefore potentially more demanding but the Iraqi air forces, modelled on the Russian is in fact air-defense oriented; it has relatively few aircraft for deep-penetration attacks and most are obsolescent, while bombers will lack escort due to the range limitations of most Soviet fighters in Iraqi service.
14. Air space defense can be provided by SAMs, ground-controlled fighter interceptors and/or by sophisticated long-range air-to-air missiles launched from sophisticated fighters. Under the Shah, Iran was attempting to deploy all three. SAMs and ground-controlled fighter interceptors are naturally complementary: the two can share much of the same EW radar overhead; but once this overhead is acquired, the third solution amounts to a costly redundancy. Iran's Hawk program was also becoming excessive in the attempt to cover too much of the country. Certainly, the SAM/interceptor complement was also becoming redundant. In short, a considerable scaling down of the Shah's expensive air defense deployment plan would be consistent with a sufficient air defense.
15. Iran also requires some deep-strike air capability for regional deterrence. But this is a limited requirement, which calls for no more than a handful of Iran's ten F-4 squadrons. Under the Shah's structure it was assumed that the F-4s would also be useful to support Iranian ground forces, but this would no longer be so under a relational/maneuver structure.

16. In general therefore the Shah's Air Force would have been excessively sophisticated for a relational/maneuver strategy. If the F-14s were to be retained, many of the Hawk battalions and also the interceptor mission for the fighter ground-attack aircraft would become redundant. Fewer F-4s would be required for the regional deterrence mission, while any aircraft assigned for ground attack would have to be much less sophisticated to be well-suited for supporting infantry fighting within the mountain barrier. In lieu of the large numbers of F-4s, and F-16s (on order), the requirement would be for light fighters (F-5s) and for small cross-section light-attack aircraft (e.g. Alpha-Jets or A-37) which could operate from simple strips and which by virtue of their greater maneuverability would be more useful in the mountains and for anti-helicopter intercept everywhere, as well as for attacks against strung-out armor columns (on the plains and the more open corridors) and of course internal-security operations.

(ii) Naval

17. The Shah's Navy was oriented to blue-water operations in the Indian Ocean. Whatever capability the Shah desired in the Arabian Sea could have been more effectively achieved by shore-based aircraft, eliminating the rationale for destroyer/frigate deployments and the DD993 Spruance purchase in particular. To the extent that Iran desires more of a reach into the Arabian Sea, submarines are in order - but not ex-U.S. World War II Tang fleet submarines. At the same cost, much more effective if smaller new-model diesels can be obtained (e.g. German type 207s). Finally, a navy with regional-power pretensions would need minesweepers minelayers and fast-attack craft which were all absent or under-represented in the Shah's Navy.

IV. RELATIONAL-MANEUVER SOLUTIONS IN THE LOCAL CONTEXT

IV.A. THE CULTURAL MILIEU VERSUS PROFESSIONAL PREFERENCES

1. Military institutions are by nature conservative, at least professionally if not politically. Senior commanders will often tend to see change in the military art as a threat to their own expertise and thus status; junior officers tend to accept the validity of the extant, implicitly assuming that it must be right for otherwise it would be done differently. Thus the professional preference is almost always for the extant - until the latter is proven to be wrong, which usually can happen only in war.
2. In the Korean and Iranian military structures, the extant has been derived from the American military model. The presumption is that a super power must know best and that what is best for Americans must be best for Iranians, Koreans, et. al., anything else being only second class. Few small-power military elites have the self-confidence to challenge these presumptions, especially in countries which themselves lack technological abilities. The Vietnamese did develop their own relational methods under the stress of necessity but even they promptly adopted standard notions of military power as soon as they themselves became locally preponderant. Few armies have had the self-confidence (and intellectual capacity) to realize that they cannot blindly adopt foreign doctrines and methods, incompatible with local material capabilities, the local political situation, and the cultural milieu.*

(i) Korea

3. In the case of Korea, it can no longer be argued that technological sophistication in the armed forces is inconsistent with the country's cultural milieu and state of economic development. South Korea is undoubtedly rapidly on its way to become a second Japan. Aside from technical skills as such, Korean society has the social discipline as

* Handel, op.cit.

well as the intellectual and economic capacity to deploy modern highly-technological military forces.

4. Nevertheless, a simplified relational-maneuver structure such as the one here advocated would still be more appropriate for Korea than the present U.S.-style forces. And it would be consistent with the Japanese and Chinese military traditions which have local validity, as was the model adopted by the North Koreans in 1950.

(ii) Iran

5. Iran is wealthy in disposable funds but the country is poor; it was only the oil revenues that created the special situation whereby Iran could purchase much radically modern military equipment. But the lack of an indigenous economic base of commensurate sophistication caused severe bottlenecks and distortions, due to the lack of trained technicians. The result was a "backend" inability to absorb the new mass of sophisticated equipment, and much disruptive competition with the civil economy for technical and managerial talent.
6. The level of technical competence within the Iranian forces makes any structures highly dependent upon complex equipment of suspect utility. But whereas the Shah's Army could not use what it had, a relational-maneuver force could make good use of some selected items of high-technology equipment. In a fluid ground-force keyed to movement and the line-of-sight fires of brigades and lesser units, complex target-acquisition and fire-direction for large caliber artillery and offensive airpower are not needed. The real test for such a system would be the ability of individual soldiers and of small-unit leaders to master the agile style of warfare that the structure requires. While this style would not come naturally to city dwellers, it would be congenial to much of the Iranian people which is still mainly rural.

IV.B. INCENTIVES

IV.B.(i) MILITARY RATIONALITY

1. The most important incentive to a shift from the present design of forces in both Iran and Korea to a relational structure is the acknowledged inadequacy of the former structure to provide a reasonably self-sufficient defense.
2. As far as Iran is concerned it is obvious that the country could not have defended itself against the USSR with the Shah's forces. And it is also obvious that his forces were ill-suited to maintain internal security. By contrast the proposed relational structure is well-suited to the demands of internal security, creates the possibility that Iran could actually mount a credible defense against a Soviet invasion and it would also perform better against an Iraqi attack into Iran, though very possibly less well for an Iranian attack into Iraq itself. (It must be noted, however, that the critical variable in this respect is not so much the size or the internal structure of the attacking force but the quality of its tactical and operational handling.)
3. As far as Korea is concerned, it has long been accepted that the ROK forces are incapable of defending against an invasion from the North on their own. The reason, supposedly, was that the South was outnumbered more than 2 to 1 in divisions, tanks, aircraft and ships. Yet it should be noted that until the recent upward revision of NK army strength, the South actually had more men under arms in peacetime, and larger reserves, than the North. By the old figures, the South outnumbered the North 622,000 to 512,000.* Even now, in the wake of the revisions, the North only marginally outnumbers the South 632 - 670,000 to 599,000.** (The South's population is of course 2.15 times greater and its GNP, 4.3 times greater.) The assumption of inadequacy in conjunction with the near-equality in numbers must be considered as prima facie evidence that the ROK has failed to structure its forces properly.

* Military Balance 1978 - 1979, op.cit.

** Military Balance 1979 - 1980, op.cit.

IV.B.(ii) ECONOMIC ADVANTAGES

1. The economic argument for relational structures (vis a' vis imported foreign structures tuned to different contexts) can be expected to be strong, though relative importance of various economic factors will obviously vary from country to country. For instance, in Korea it is foreign exchange that is the most important consideration; on the other hand in Iran it was the competition for scarce technicians, already in short supply in the civil economy.
2. In almost all cases, relational structures for developing countries will demand significantly less foreign exchange because equipment will be cheaper in toto and more can be produced at home. In budgetary terms relatively more will be spent on manpower and less on equipment. The reduced emphasis on complex equipments (as compared to U.S.-style force-structures) also entails a correspondingly reduced requirement for scarce technical skills. However the so-called "price" effect must be recognized. This effect is that the existence of a budget surplus at the planned force level can lead the country (or countries) to employ this surplus (and perhaps additional funds) in an attempt to enlarge the armed forces to fulfill purposes previously seen as mere wishes, impossible to achieve.
3. Relational warfare is inherently a cheaper form of warfare than the warfare of positions and firepower. The aim is to outpace and outmaneuver the opponent, and not to achieve physical destruction - which was expensive in World War I and has become increasingly so in more recent years. In terms of micro-costing, it is obvious that the cheaper logistics and equipment associated with relational-maneuver reduces the cost of existing combat forces. The empirical question is whether these savings are sufficient to re-equip supporting units in order to convert them into additional combat units. The answer falls in three parts:
 - (1) In some cases, such as warfare in high mountains, a relational system is so much more effective that the combat arms themselves can be reduced in size. (A historical example of this extreme is that of the

Sino-Indian conflict in 1962. High-quality Indian troops steeped in a British tactical tradition were thoroughly trounced by a numerical much weaker but much more agile Chinese force.)

- (2) The cost of the supporting units themselves is not low. In the extreme, their cost (e.g. for construction engineers or sensor units) may exceed those of combat units in the maneuver style.
- (3) The savings potentially available within the combat formations themselves have become substantial in recent years if high-technology solutions are displaced by good combat techniques tactics.

IV.B.(iii) REDUCING DEPENDENCE (VIZ. MAINTAINING LINKAGE)

1. The adoption of a relational structure should normally result in a reduced dependence upon foreign arms suppliers, though most nations would still remain dependent upon foreign suppliers in critical, high-technology areas such as air defense. In general however, the level of dependence should decline.
2. Linkage implies the expectation of supplier leverage vis a'vis the recipient. But all too often the leverage relationship is reversed. The supplier's leverage is obtained by his ability to control the line of sustenance. The recipient's leverage is obtained by his involving the prestige and industry of the supplier into its concerns, and especially the aerospace industries, (even if its products are not critical for the recipient's defense). In such conditions, the so-called "back-end" implementation of arms sales can reverse the direction of linkage.* Relational structures would normally entail less leverage for the supplier, but also less "back-end" leverage for the recipient.

* For a discussion of this thesis, see U.S. Military Sales to Iran, a Staff Report to the Subcommittee on Foreign Assistance of the Committee on Foreign Relations, U.S. Senate, July 1976, pp. XIII-XIV.

IV.B.(iv) INTERNAL-SECURITY CAPABILITIES

1. It must be recognized that in general, relational systems tend to imply a greater capability for internal security. -Highly complex equipment is mainly of use to contend against similarly complex enemy equipment and is also in general too destructive (or simply irrelevant, e.g. SAMs) for population-control and internal security. High-technology systems will also absorb the funding and personnel (particularly in logistic support) at the expense of maneuver units capable of performing internal security tasks.
2. The key task in internal security is population-control, a function that only a police or gendarme organization can provide. An army is by nature ill-suited for the task, its function being rather to protect the police from organized armed groupings. This in turn is principally an infantry task. Heavier forces only become appropriate if internal conflict evolves into a full-blown civil war. The more a force structure is simplified and its use of complex weapons-systems is reduced, the more relevant it becomes for the tasks of internal security.

V. IMPLICATIONS FOR U.S. ARMS TRANSFER POLICY

V.A. SECTORAL ASPECTS

V.A.(i) THE IMPACT ON THEATRE SECURITY

1. In the past, American security-assistance policy has tended to encourage a dangerous dependence by our allies on U.S. politico-military support. The military postures adopted by such allies as Korea and Iran have implicitly been designed on the assumption that a similarity in procedure and of equipment would facilitate cooperation with U.S. reinforcements and U.S. operational control. The unforeseen result has been to create an unnecessarily weak and fragile indigenous defense which requires U.S. help early, even against moderate threats. And any U.S. reinforcements would be arriving into chaotic conditions which could prevent the effective deployment of such U.S. forces.
2. The relational approach trades off the undisputed advantages of U.S.-connected systems for a more capable local defense obtained by a division of labor and by force-specialization. The desired level of overall military capability is then obtained by the mix of specializations, in lieu of an aggregation of the capabilities of general-purpose forces, both local and American.
3. In general therefore the increase in indigenous capabilities resulting from the adoption of a relational approach should raise the threshold of American military involvement in theatre conflicts. From the viewpoint of allied countries, this greater self-sufficiency however is a mixed blessing - for it implies a less automatic U.S. commitment, and therefore reduced deterrence vis a' vis their antagonists. This, however, is of course a deterrence and stability that derives not from a country's own strength but rather from the commitment- and credibility- of an outside power. A relational approach by contrast inherently emphasizes a country's own capabilities, in the process perhaps unavoidably downplaying the linkages to (and commitments from) outside powers and alliances. Against major powers the linkage should remain sufficiently visible, and it is clear that the self-sufficient defender will make

invasion more costly. Against a regional competitor of more equal power, the linkage may be less visible, a possibility compensated by two factors: a relational defender's greater ability to defend (= deterrence by denial) and more importantly, his greater ability to attack, giving relational defenders a measure of more potent deterrence - that of the threat of punishment against the attacker's own domain.

4. As for regional stability, relational systems are neutral, even if reversing relative roles. At present, regional stability is often undermined by the military weakness of American allies and held in check only by the American commitment. Shifting to a relational approach will often reverse the scales, shifting relative weakness to the side of the regional competitor and the counterweight role to its major ally.
5. The initial shift to a relational system may trigger an incipient arms race. But at any one level of armament, a relational system is cheaper and the weapons systems associated with it are less provocative and destructive. But the very fact of its adoption may shift the scales of relative power, and this in itself can lead to an arms race. However, this is a race in which the relational military structure, by demanding less in resources than more conventionally-oriented structures, can effectively outpace the opposition. Moreover, in the extreme (as in Korea) where one side is in the aggregate much stronger economically, the smaller side could be forced out of an active independent competition and into a passive role under the shadow of its major ally.

V.A.(ii) THE INSTITUTIONAL PROBLEM

1. U.S. arms transfer policies are heavily influenced by the notions of personnel detailed from the military services. Such officials naturally share the frame of reference of their service, its doctrine and tactical concepts. The possibility that officials with such a background might seek to further the interests of their services in more economical production runs (or quicker equipment turnover) by means of transfers is familiar. What remains unrecognized is the tendency to impose on foreign countries the high-cost deployment style favored by the U.S. military services, in the well-meant but mistaken belief that any other approach must simply be inferior.
2. The relational approach requires an eclectic choice of doctrine, tactics, organization and equipment. Considering the large number of countries involved and the diversity of their contexts, the design of a relational approach for each is obviously a difficult, if not impossible, task for the security assistance planners of the U.S. Government. U.S. support for the relational alternative would thus mean that much decision-making (and therefore institutional power) would have to be shifted from USG to third-country decision-makers.

V.B. STRATEGIC ASPECTS

V.B.(i) LINKAGE AND DEPENDENCE FROM THE USG VIEWPOINT

1. As argued in IV.B.(iii) above, relational solutions will tend to reduce overall dependence.
2. While this change is obviously an advantage for the recipient country, the supplier would still retain a degree of leverage over the recipient. Whether such leverage can be used to actually influence the actions of the recipient is of course another matter. More influence is likely to result from the supplier country's political stance overall than from its status as a weapons supplier. The attempt to influence recipients by threats to cut off military supplies can easily become counter-productive: over the long-run the result may be to encourage stockpiling, self-sufficient production* and fait accompli.
3. There has of course been much discussion in the academic literature over the concepts and experience of linkage, dependence, and leverage. All that can be said is that it is an open question whether the manipulation of arms transfers is an effective - or even desirable-instrument of U.S. foreign policy.

* Eventually with an export potential.

V.B.(11) THE IMPACT ON U.S. REINFORCEMENT REQUIREMENTS

1. U.S. reinforcement requirements are generally scaled to meet shortfalls in theatre requirements, as measured by force ratios and armored-division equivalents (ADEs) in a process where local ADEs are subtracted from total required ADEs to yield the ADE requirement which the U.S. is to supply. The relational solution challenges this methodology.
2. Relational solutions for third countries raise the threshold of local defense capabilities, implying that there will be fewer occasions, and lower requirements for U.S. reinforcement. There are also two other presumptive advantages. First, a relational solution will almost always result in an "unbalanced" force-structure, often (though not always) with less emphasis on air and naval forces. To the extent that more 'balance' may be needed in a given conflict or crisis situation, air or naval reinforcement is easier for the U.S. both politically and in time-of-delivery than ground reinforcement. Second, to the extent that specialized relational forces are needed to cope with local conditions as well as to develop the situation for the application of heavier, general-purpose forces, a relational approach can be symbiotic, increasing the effectiveness of the U.S. military contribution, if U.S. help turns out to be necessary after all. Instead of a directly compatible but fragile set of local forces, there would be less interoperable but robust local forces, whose resistance would allow more time for U.S. reinforcement, and which would be better able to provide a secure and orderly entry environment, thus minimizing the danger of a debacle.

Table I-1
CHARACTERISTICS OF NKAF AIRCRAFT

Aircraft	MiG-15	MiG-17	MiG-19	MiG-21	Su-7B	IL-28
Speed, Maximum						
Hi	630 mph	702 mph	902 mph	1,385 mph	1,187 mph	559 mph
Lo	684 mph	711 mph	750 mph	808 mph	721 mph	497 mph
Range, Maximum						
Int. Fuel	590 mi.	422 mi.	864 mi.	683 mi.	400 mi.	1,000 mi.
Max. Fuel	884 mi.	913 mi.	1,367 mi.	1,138 mi.	900 mi.	1,355 mi.
Combat Rad.						
(Hi-Lo-Hi)	120 mi.	120 mi.	200 mi.	200 mi.	279 mi.	400 mi.
W/Payload	1,102 lbs	1,102 lbs	1,102 lbs	1,102 lbs	2,204 lbs	2,204 lbs
Max. Payload	1,102 lbs	1,102 lbs	1,102 lbs	2,204 lbs	6,615 lbs	2,204 lbs
Armament	1 x 37 mm 2 x 23 mm	3 x 23 mm	3 x 30 mm 4 x AAM	1 x 23 mm 2 x AAM	2 x 30 mm	4 x 23 mm
Avionics*	D	D	D	C	C	C
Maneuverability**	B	A	A	B	C	C

* Avionics rated from A (excellent) to D (poor).

** Maneuverability rated for radius of turn, rate of turn, and rate of roll from A (excellent) to D (poor).

Source: The Observer's Soviet Aircraft Directory, by William Green and Gordon Swanborough, 1975.

Table I-2
NKAF ASSETS, 1979 - 1980

3 squadrons x 28 Il-28 (+1 in reserve)
1 squadron x 20 Su-7B Fighter/Ground Attack
2 squadrons x 20 MiG-15/17 Fighter/Ground Attack
6 squadrons x 20 MiG-21 Interceptors
15 squadrons x 20 MiG-15/17/19 Interceptors

200 AN-2
40 AN-24
10 Il-14/18
1 Tu-154

50 Mi-4 Helicopters
10 Mi-8 Helicopters

70 YAK-18 Trainers
100 MiG-15 UTI/21U, IL28U Trainers

250 SA-2 Guideline
ATOLL IR homing AAM

NB: Pilot proficiency of the NKAF may be lower than that of the ROKAF, due to the fact that flight time is limited to under 100 hours per year, viz. 250 plus hours per year in PACAF and ROKAF. This lack of training time will most seriously effect night and bad weather flying, navigation and air combat.

Source: IISS Military Balance, 1979 - 1980.

Contract No. AC9WC112

Table 1-3

NKA AAA CHARACTERISTICS

<u>Gun</u>	<u>ROF</u>	<u>Short Range</u>	<u>Lethal Altitude</u>	<u>Maximum Altitude</u>
12.7mm DSLK	450-550RPM	4,500'	960'	4,800'
14.5mm ZPU-14-2	450RPM	4,500'	1,200'	6,400'
37mm M-38	120RPM	9,600'	1,500'	9,600'
57mm M-50	120RPM	16,000'	640'-2,000'	20,000'
85mm M-44	30RPM	22,500	4,800'-10,000'	25,000'
100mm M-49	30RPM	25,000'	3,200'-20,000'	32,000'

Source: Jane's Weapons Systems
IISS Military Balance
John Keegan, World Armies

Contract No. AC9MC112
Table I-4
ROK ARMY AVIATION ASSETS, 1980

14	O-2A	FAC Aircraft
20	OH-1B	Utility Helicopters
44	OH-6B	Observation Helicopters
5	KH-4	Helicopters
25	Hughes 500	Observation Helicopters

Source: IISS Military Balance, 1979 - 1980.

Table I-5

MAJOR FORMATIONS AND EQUIPMENT, NKA, 1979-1980

MAJOR FORMATIONS, NORTH KOREAN ARMY, 1979-80

2 Tank Divisions
 3 Motor Rifle Divisions
 35 Infantry Divisions
 4 Independent Infantry Brigades
 8 Light Infantry Brigades
 3 Reconnaissance Brigades
 3 AAA Divisions (Fixed, territorial)
 5 Independent Tank Regiments
 5 Airborne Divisions
 20 Artillery Regiments
 10 AAA Regiments (mobile)
 23 Reserve Divisions (Cadre only)

MAJOR EQUIPMENT, NORTH KOREAN ARMY, 1979-80

Tanks

T-34/85	350
T-54/55, Type 59	1800
PT-76	100
Type 62 Light	50

APCs

BTR-40, -60, -152	800
M-1967	NA

Artillery

Towed, up to 152mm, guns and How.	3500
Mortars, up to 160mm	9000
SPG-9 82mm RCL	1300
57-100mm AT guns	NA
AAA, 37, 57, 85, 100mm towed, ZSU-52-2 SP,	5000+
FROG 5	9+

Source: IISS Military Balance

Table I-6
MAJOR ELEMENTS, ROKA, 1969-1980

Type	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Infantry Div.	19	19	19	19	19	19	23 ^d	23	18	19	19	19
Mechanized Div.	-	-	-	-	-	-	-	-	-	1 ^f	1	1
Marine Division	-	-	-	1	1	1	1	1	1	1	1	1
Marine Brig.	5	5	5 ^c	-	-	-	-	-	-	-	-	-
Ar. Brig., Ind.	2	2	2	2	2	2	2	2	2	2	2	2
Inf. Brig., Ind.	-	-	-	-	-	-	-	-	2	-	-	-
AB/SF Brig.	-	-	-	-	-	-	-	-	5	5 ^j	5	5
Tank Bn., Ind.	-	-	-	-	-	-	-	-	7	7	7	7
Arty. Bn.	40	80 ^a	80	80	80	80	40 ^e	40	30 ^h	30	30	30
SSM Battalion	1	1	1	1	1	1	1	1	1	1	1	1
HAWK SAM Bn.	2	2	2	2	2	2	2 ^f	2	2	2	2	2
HERCULES SAM Bn.	1	1	1	1	1	1	-	-	-	-	-	-
Air Def. Brig.	-	-	-	-	-	-	-	-	2	2	2	2
Res. Divs. (Cadre Only)	10	10	10	10	10	10	6 ^g	6	10	10	10	10
Res. Tk. Bn.	4	2 ^b	-	-	-	-	-	-	-	-	-	-

Source: IISS Military Balance, 1969 - 1980.

NOTES TO TABLE I-6

- a. Artillery battalions were reorganized with one half their former establishment, (9-12 tubes per battalion).
- b. No further mention is made of the reserve tank battalions after 1969, but it is difficult to resolve the total ROKA tank inventory if these were stricken from the army list.
- c. One ROK Marine brigade was serving in Vietnam until 1971. In 1972 the ROK Marine Corps was reorganized into one Marine division on the American rectangular model (4 brigades of 4 battalions, 20,000 men). At present only two Marine brigades have amphibious vehicles (LVTP-7s).
- d. Reflects the mobilization of four reserve divisions in wake of increased border tensions.
- e. Enlargement of artillery battalions by consolidation.
- f. The Hercules SAMs were consolidated into HAWK units.
- g. Reflects the reduction in reserve forces due to mobilization.
- h. A change from four-gun batteries to six-gun batteries.
- i. A mechanized division was raised by consolidating two independent infantry brigades.
- j. Status changes from Airborne to Special Forces.

Table I-7
MAJOR EQUIPMENT, ROKA, 1969-1980

Weapons	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Tanks</u> * M 60	0	0	0	0	50	60	60	60	60	60	60	60
M 48A1/2/3	350	400	400	400	500	640	640	640	640	640	640	640
M 47	350	300	300	250	200	200	200	180	180	180	180	160
M3A1/M5A1	80	80	80	50	?							
M4A3E8	200	200	200	100	100	100	?					
M24/M41												
<u>Tank Destroyers</u>												
M10	60	60	50	40	30	?						
M18	85	60	60	60	50	50	50	50	50	50	50	50
M36	110	110	100	100	100	100	100	100	100	100	100	100
<u>Armored Personnel Carriers</u>												
M113/113A1	200?	300?	300?	300	300	400	400	400	500	500	500	500
Fiat 6614	0	0	0	0	0	0	0	0	0	0	20	20+
LVTP7	0	0	0	0	0	0	0	0	0	160	160	160
<u>Armored Cars</u>												
M8	45	45	45	45	45	45	45	45	45	45	45	45
<u>SP Artillery</u>												
M107 175mm gun	0	0	12	12	12	12	12	12	12	12	12	12
M110 203 mm how.	0	0	0	16	16	16	16	16	16	16	16	16
M109 155 mm how.	0	0	0	0	0	0	0	0	0	0	76	76

Table I-7
MAJOR EQUIPMENT, ROKA, 1969-1980 (CONTINUED)

WEAPON	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Towed Artillery</u>												
M115 203mm how.	48	48	48	48	48	48	48	48	48	48	48	48
M1A1 155mm gun	24	24	24	24	24	24	24	24	24	24	24	24
M114 155mm how.	225	225	225	225	300	400	400	400	400	400	400	400
M101A1 105mm how.	700	700	700	700	1000	1000	1500	1500	1500	1500	1500	1500
<u>Surface-to-Surface Missiles</u>												
Honest John	12+	12+	12+	12+	12+	12+	12+	12+	12+	12+	12+	12+
<u>Surface-to-Air Missiles</u>												
HAWK	80+	80+	80+	80+	80+	80+	80+	80+	80+	80+	80+	80+
Nike Hercules	45	45	45	45	45	45	45	45	45	45	45	45
<u>ATGW</u>												
TOW	0	0	0	0	0	0	0	0	4900	4900	4900	4900
TOW Launchers	0	0	0	0	0	0	0	0	260	260	260	260
<u>AAA</u>												
40 mm Bofors	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	40	40
20 mm M61 Vulcan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	.66	66
<u>Mortars</u>												
M2 60mm	NA	NA	NA	NA	NA	NA	NA	3000	3000	5300	5300	5300
M1 81mm												
M29 81mm												
M2 107mm												
M30 107mm												
<u>Recoilless Rifles</u>												
M18/M18A1 57mm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M20 75mm												
M40 106mm												

Table I-7

MAJOR EQUIPMENT, ROKA, 1969-1980 (CONTINUED)

WEAPON	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Rocket Launchers</u>												
M20 3.5" Bazooka	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M72/M72A1 LAW												

NOTES

* Total tank and APC inventory is not representative of actual number of operational vehicles. According to Taoka Shunji, Defense Editor of Asahi Shibun, in 1975 ROKA had only 360 serviceable tanks out of a total inventory of 800. Additionally, more than 100,000 trucks were out of commission for lack of spares or repair facilities. It is therefore logical to assume that this problem extends to all mechanised equipment in the ROK Army. Perhaps no more than two-thirds of all tanks, APCs, SP guns, trucks, and other vehicles are actually combat ready at any given time.

General: Figures given here are in many cases extrapolations of available sources, and can be considered approximations, rather than specific counts.

Sources: IISS Military Balance, 1969-1980

SIPRI Yearbooks

Arsenal of Democracy, by Tom Gervasi

Aviation Week and Space Technology

Interavia

Air International

Aviation and Marine

ROKAF ASSETS, 1980

<u>Unit</u>	<u>A/C</u>	<u>Role</u>	<u>No.</u>	<u>Notes</u>
1st FW	F-4D/E	FGA	18/19	4 sqns; 18 more F-4E being delivered.
10th FW	F-5E/F	FGA	126/9	4 sqns; F-5A/B being replaced from
	RF-5A/E	Recce	12	mid - 1970's
11th FW	F-86F	FGA	50	2 sqns; being phased out and replaced by F-5E
12th FW	F-86D	INT	18	1 sqn; phasing out
	S-2A/F	ASW	20	1 sqn; ROK Navy
	T-28	TR/COIN	20	Not all serviceable
	T-33	TR	30	Not all serviceable
	T-41D	TR/COIN	20	
	F-5B		30	Phasing out
	OV-10G	COIN	24	

Helicopters:

OH-1B	6
OH-1D	5
Bell 212	2

Maverick AGM; AIM-7E, AIM-9L AAMs.

Source: IISS Military Balance, 1979 - 1980.

Table II-1
MAJOR ELEMENTS, IMPERIAL IRANIAN ARMY

TYPE	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Armored Division	1	1	3	3	2	3	3	3	3	3	3	3
Infantry Div.	7	7	3	3	5	2	2	4	4	4	3	3
Armored Brig.	1	1	0	0	1	0	0	0	0	0	1	1
Infantry Brig.	0	0	4	4	0	2	2	0	2	2	1	1
Airborne Brig.	0	0	0	0	0	1	1	1	1	1	1	1
SF Brigade	0	0	0	0	0	1	1	1	1	1	1	1
SAM Battalion	1	1	1	1	1	1	1	1	1	4	4	4

Source: IISS Military Balance.

Table II-2
MAJOR EQUIPMENT, IMPERIAL IRANIAN ARMY

WEAPON	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Tanks</u>												
M24	180	100	100	100	100	50	50	?				
M41	100	100	100	100	100	80	50	?				
M47	160	160	160	160	160	160	160	160	1160	160	160	160
M48	240	240	240	240	240	240	240	240	240	240	240	240
M60A1	460	460	460	460	460	460	460	460	460	460	460	460
Chieftain	0	0	0	20	60	300	300	500	760	760	875	875
Scorpion AVR(T)	0	0	0	0	0	0	0	0	250	250	250	250
<u>Armored Personnel Carriers</u>												
M113	300	300	300	400	400	400	350	350	350	325	325	325*
BTR-40/50/152	270	270	270	300	300	300	250	250	250	200	200	200
BTR-60	300	300	400	400	400	400	350	350	300	300	300	300
BMP-1	0	0	0	0	0	0	0	0	0	100?	100?	100?
<u>Armored Cars</u>												
M8	100	100	100	100	100	100	100	60	32	32	32	32
M20	140	140	140	140	140	140	140	100	48	48	48	48
Ferret	0	0	0	0	0	0	0	100?	100?	100?	100?	100?
Fox	0	0	0	0	0	0	0	0	75?	75?	75?	75?

Table II-2
MAJOR EQUIPMENT, IMPERIAL IRANIAN ARMY (CONTINUED)

WEAPON	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Self-Propelled Artillery</u>												
M110 203mm how.	NA	NA	NA	NA	0	14	14	14	14	14	14	14
M107 175mm gun	NA	NA	NA	NA	0	30	30	30	30	38	38	38
M109 155mm how	NA	NA	NA	NA	200	300	390	390	390	440	440	440
BM-21 122mm RL	NA	NA	NA	NA	0	64	64	64	64	72	72	72
<u>Towed Artillery</u>												
M101A1 105mm how.	NA	NA	NA	NA	330	330	330	330	330	330	330	330
M1A1 155mm gun	12	12	12	12	12	12	12	12	12	12	12	12
M114 155mm how	NA	NA	NA	NA	100	100	100	100	100	112	112	112
M115 203mm how.	NA	NA	NA	NA	14	14	14	14	14	14	14	14
130 mm how. (Sov)	NA	NA	NA	NA	60	60	60	60	60	90	90	90
<u>ATGWs</u>												
TOW (+ Launcher)	0/0	0/0	0/0	0/0	0/0	0/0	6700/200	10,000/350	1500	550		
Dragon (+ Tracker)	0/0	0/0	0/0	0/0	0/0	0/0	4000/600	4000/600	4000/600			
SS-11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENTAC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table II-2
MAJOR EQUIPMENT, IMPERIAL IRANIAN ARMY (CONTINUED)

WEAPON	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Surface-to-Air Missiles</u>												
HAWK	500	500	500	500	500	500	500	1800	1800	1800	1800	1800
HAWK Batteries	18	18	18	18	18	18	18	37	37	37	37	37
Rapier	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA
SA-7/9	0	0	0	0	0	0	0	NA	NA	NA	NA	NA
Tigercat	NA	NA	NA	NA	NA	?	25	25	25	25	25	25
<u>AAA</u>												
23, 35, 40, 57, 85 mm towed AA guns	NA	NA	NA	NA	NA	NA	550	550	550	1800	1800	1800
ZSU-23-4/-57-2	0	0	0	0	20	20	70	70	70	100	100	100

Source: IISS Military Balance

Table II-3
ARMY AVIATION ASSETS, 1979-1980

90 CH-47C	
20 AB 206	
50 AB 205A	
285 Bell 214	Helicopters
205 AH-1J	

10 O-2A	
2 F-27	
5 Shrike Commander	
2 Falcon	Aircraft
6 Cessna 310	
40 Cessna 185	

Source: IISS Military Balance

Table II-4
AIR FORCE ASSETS, 1979-1980

10 squadrons x 19 F-4D/E
8 squadrons x 20 F-5E/F (+6 ac. in reserve)
4 squadrons x 18 F-14(?) (+5 ac. in reserve)
1 squadron x 14 RF-5E
4 squadrons x 13 C-130E/H

Source: IISS Military Balance

APPENDIX

ENVIRONMENTAL FACTORS AFFECTING AIR OPERATIONS IN KOREA

1. The Korean Peninsula is a harsh operational environment, especially for aircraft. Extremes of heat and cold ranging from 30° C to -30° C affect both men and material. Winter lasts a full six months. Rain and ground fog are common, especially during the monsoons of June, July and August. Low cloud ceilings often enshroud the many (low) mountain tops.
2. The terrain is steeply mountainous, bisected by deep valleys which are often the only practicable routes for motor vehicles. These mountains, while rugged, are rather low, averaging between 1,600 and 2,000 feet in height. Only 20 percent of the land is reasonably flat. Hill vegetation is sparse and for the most part scrubby.

Under combat flying conditions, these environmental factors have a significant impact on operations. At the extremes of heat and cold, equipment failures become common. During the summer, the heat increases the takeoff distance of aircraft and reduces range and payload. Poor visibility is present throughout much of the year, often worse than CAT 2 and CAT 3* conditions. When combined with the need to attack targets in deep valleys, the low cloud ceiling and fog make operations difficult for aircraft without the avionics or maneuverability to fly either through or beneath the overcast. Poor visibility also makes target acquisition difficult. Fog and rain would cause the attenuation of laser signals, to the point of neutralizing laser guided munitions in many cases.

3. The lack of naturally flat land makes unprepared field landings and take-offs difficult, causing each side to rely heavily on prepared airbases.

* Degrees of blind landing conditions.

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